The Strategic Management of Projects to enhance Value for Money for BAA plc Volume I

by

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Abstract

The airport business is undergoing a shift from that of a traditionally operational nature, to a more commercial, profit driven business orientation. Airport infrastructure is experiencing a face lift in order to meet the requirements for customer satisfaction resulting from this shift in culture. In this regard airport operators must seek improvements in the way in which their development projects are planned, designed and delivered.

An inherent link between corporate, business and project value, highlighted within this thesis, has led to the requirement for project management systems that maximise value and therefore facilitate the corporate strategy of the organisation.. This thesis develops a model to strategically manage projects to enhance value for money for BAA plc. It is concluded that the project management process is divided into two primary phases: the strategic and tactical, the former receiving minimum attention in UK construction project management. By combining the strategic management of a portfolio of projects with the tactical management of individual projects a link is forged between corporate and customer value and project value.

The thesis concludes by presenting the Strategic Project Management framework for use by BAA project managers. The decision making framework facilitates the definition of project objectives and manages the project process to realise optimum value to the client / customer groups. By defining sub processes within the overall project process, the framework binds the interfaces such that information and communication flows freely and completely through the project.

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Glossary

Term	Explanation
AACC	Airport Associates Coordinating Council
AAL	Aberdeen Airport Ltd
AEA	American Economic Association
BAA	The airport owner/operator organisation sponsoring this research project
CAA	Civil Aviation Authority
EAL	Edinburgh Airport Ltd
FAA	Federal Aviation Administration
GAL	Gatwick Airport Ltd
GLAL	Glasgow Airport Ltd
HAL	Heathrow Airport Ltd
Hub	The core for passengers transferring between flights
IATA	International Air Transport Association
MMC	Monopolies and Mergers Commission
SAL	Southampton Airport Ltd
STAL	Stansted Airport Ltd

1 INTRODUCTION

The management of major projects has been of significant interest in the UK over the past decade as the construction industry struggles to respond to the increasing demands of clients. The building client has become aware of the apparent productivity gains of the North American system, the quality gains of the Japanese system and is demanding better service from the construction industry. As competition increases within a starved market the construction industry has attempted to provide the services requested in order to win construction contracts from prestigious clients. It is the opinion of some that the response of the contracting and management organisations has been only partially effective and that in order to make any significant improvements in the construction output of the UK a cultural shift must take place.

The investigations conducted in the field of construction have encompassed project case studies, assessments of critical success factors, benchmarking between the UK, North America and Europe, academic studies of communication interfaces within the project process, direct interviews with construction personnel, etc. The conclusions of these studies have been numerous but each containing the message that change is required in order to compete internationally. Client organisations have taken upon themselves the task of seeking and activating improvements in the project process, taking leadership in the cultural evolution of the Uk construction industry.

BAA plc, the world's largest private airport operator, is one of the client organisations actively involved in the search for better value from the construction industry. BAA plc, owner of seven airports in the UK including the three London airports, has a construction spend in excess of £300m per annum. The construction activity within BAA plc has been prompted by a number of factors within and outwith the organisation's environment. Primarily the organisation underwent privatisation in 1986, opening the door to commercial freedom and ultimate control over the way in which money was invested. As a result the organisation has experienced significant structural and cultural change to facilitate a successful shift into the private domain. Deregulation of the airline industry

has meant that airports must now actively pursue airlines and compete for their business. This has itself led to the increased awareness of the customer and the importance of providing value for the customer. A combination of these factors has resulted in the pursuit of value for money in both the business operations and new developments.

BAA plc has been set a number of challenges by the new Chief Executive (for example, to half the cost of their construction projects), in order to encourage suitable strategies in response. New values have since emerged, focusing on relationship building, service orientation and involving end users. Project Managers are now expected to deliver *World Class* projects meeting the customers expectation with value for money. In response to the challenge BAA plc have embarked upon a program of improvements to the project management process using the experience of internal and external professionals to assist in the continuous improvement effort. This thesis forms one aspect of the ongoing improvement process. The researcher, employed by BAA plc, has been sponsored to conduct this research on behalf of Group Technical Services, BAA plc. In response to the perceived need for BAA plc, as a major building client, to take a leading role in the cultural changes required of the industry, it was agreed that a long term investigation of the project process would be beneficial. The brief from BAA plc comprised references to value for money in the context of the building process to including a benchmarking exercise of the North American and Japanese construction industries, perceived as holding competitive advantage.

1.1 The contribution of the PhD thesis

Early conclusions resulted in the requirement for a model for the strategic management of projects for BAA plc in order to add value to the construction process. Current models for the management of projects, whilst highlighting the need for early planning of individual projects, do not combine the required strategic actions with the tactical actions to successfully manage a series of projects. This thesis develops a model for the strategic management of individual projects from the client perspective. In addition, a requirement was identified for a simple framework with easy to use check lists to guide managers within the client organisation through the decision making

process. The framework presented in this thesis provides a series of checklists to ensure that all factors necessary to maximise value and conclude projects successfully are considered.

These requirements became apparent as the conclusions of the study were formulated. The ensuing points highlight the main conclusions:

- Many investigations have taken place over the past few years concerning the problems of the construction industry with only a few prescriptions for the required improvements.
- Client organisations have been poor in providing information to the construction industry, moving too fast in the early stages without understanding their needs.
- In order to create value during the construction process all parties to the project must understand the clients expectations, adding value accordingly to holistically create value to the customer.
- The client organisation must embark upon a number of strategic activities in order to define value prior to embarking upon individual projects. Thus projects may be split into strategic and tactical tasks.
- The BAA plc organisation requires a framework to bind its separate business units in a common approach to construction projects.

Due to the nature of the client organisation and the researchers position within that organisation, a combination of research methods have been used to develop the strategic project management model from within the organisation. A preliminary model was developed and exposed to members of the sponsoring organisation and a sample of other international organisations. The use of Grounded Theory allowed themes and theories to emerge from the samples' comments and model amendments. In order to carry the organisational members along with the research and minimise the resistance to change, Action Research was employed to facilitate the gradual implementation of the model attributes.

1.2 The format of the thesis

The thesis is concerned with a variety of interacting and interdependent issues as illustrated in figure 1.1. As indicated by the two way arrows, each issue has an influence on those around it causing difficulties in their sequential presentation. For example, in discussing the airport business it is necessary to discuss the corporate strategy in detailing the shift in the nature of airports in the pursuit of value for money. The thesis is concerned with airport projects linking the airport business with project strategy in the search for value for money. The project process is itself a change mechanism linking the corporate strategy and the project strategy. The interwoven nature of these issues does not lend itself easily to the sequential nature of the thesis document. It is for this reason that the thesis has been divided into parts, each discussing a different element of the network in figure 1.1.

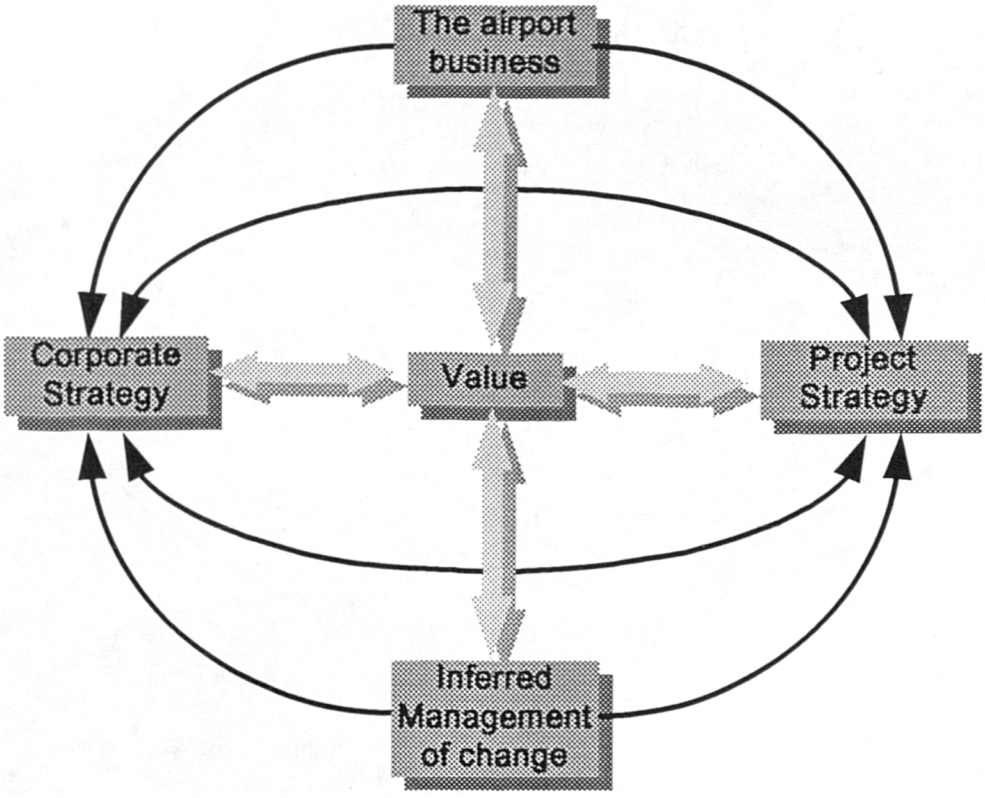


Figure 1.1 The network of issues involved in the development of the model

Due to this interrelationship the thesis will synthesise the argument as it progresses rather than present all the synthesis in a single chapter in the traditional way. Whilst this enables clarity, it does lead to a non traditional thesis presentation.

Part One entitled *BAA plc within the airport industry* sets the context for the thesis, which is inherently concerned with airport projects. It is necessary to have an understanding of the airport industry in order to establish the requirements for a model within the airport client organisation. Part one, containing chapter two, initially describes the nature of the airport industry and the characteristics of an airport project, proceeding to redefine the definition of an airport to include the commercial orientation now witnessed throughout the shifting airport industry. The second half of the chapter continues by discussing the specific nature of BAA plc, the sponsoring organisation, arguing the importance of achieving value for money within construction to assist the development of the organisation.

Part Two entitled *Corporate strategy through multi projects* is made up of chapters three and four. Chapter three argues that value is customer dependent and introduces the value chain concept as a tool to analyse the environment. The strategic management process is described as a means to implement a strategy in response to the environmental analysis. Chapter four suggests that implementation of the corporate strategy is achieved through a series of projects. By showing the inter relationship between the project strategy and the corporate strategy the chapter argues that value may be added to the business through the strategic management of a *portfolio of projects*.

Part Three entitled *The successful management of individual projects* is constitutes chapters five and six. Chapter five relates the value chain concept to the individual project highlighting the complexity of the value relationships within a construction project. In order to reduce the impact of the impediments to value creation during the project, it is suggested that value may be enhanced through management of the product and the project process. Chapter six identifies adherence to a set of critical success factors as a means to achieving success across the project value chain. The chapter consolidates the conclusions from recent studies of the project success factors to highlight the features required in a model ensuring success for the construction client.

Part Four entitled *Research data collection and analysis* documents the original work in the thesis in chapters seven to eleven. Chapter seven synthesises the conclusions from the preceding chapters in developing a preliminary model for the strategic management of projects for an airport client. The model identifies a strategic and tactical delineation, a series of project stages each with its own action plan of tasks for the project manager, held within a framework to enhance the project value. Chapter eight discusses the options for collecting and analysing the data to test the preliminary model, concluding that the interaction of a variety of data collection methods would be appropriate. Due to the nature of the study the action research methodology is suggested to interject in the organisational processes and test the model via implementation. The results from the pilot study are contained in this chapter.

Chapter nine reports the results from the testing of the preliminary model, supported by the data held within the appendices. The chapter also reports the views from the research sample regarding the airport project characteristics and highlights benchmarks across the international sample. Chapter ten uses the conclusions from the previous chapter to implement the necessary amendments to the preliminary model. The final model is produced alongside the checklists for tasks to be conducted at each stage of the project; the checklists for the development of the briefing document; the project milestones, etc. The chapter presents the project as an amalgamation of sub processes each combining to add value across and between the project stages. The chapter also produces a model for the strategic management of small projects. Finally chapter eleven draws final conclusions for the thesis suggesting the work required to proceed and develop the thesis.

The thesis therefore presents a series of interacting issues sequentially for the purposes of clarity in the thesis document, however, it should be borne in mind that none of the issues may be considered in total isolation from the others. Part four of the thesis facilitates the fusion of each of these issues in the model development.

Part One

BAA plc within the Airport industry

Part One addresses the characteristics of the airport industry that have led to a shift in focus from an airport operator to a commercially oriented business organisation. The nature of BAA plc, the sponsoring organisation, is discussed in relation to the airport industry.

Part One sets the scene for the remainder of the thesis by concluding that the future development of BAA plc relies on the successful completion of customer oriented construction projects.

2 INTRODUCTION

Historically airports have been considered as operational units facilitating the processes associated within incoming and outgoing aircraft. This traditional operational definition of an airport has been challenged by the emergence of commercially run airports, finding alternative sources of income to generate profit. A small number of airports have become privately owned being accountable to their shareholders only for continued growth and development.

An airport forms part of a wider system of organisations providing a service to their mutual customers, forming a national asset.

This chapter will address the issue of the functions of an airport defining both its core business and the drive behind privatisation. It will be argued that an airport may no longer be considered as simply a place for the intermodal transfer of passengers between land and air transport, but as a commercially run business enterprise motivated by the need to provide profit and add value to the process for it's customers.

The chapter will close with an introduction to the sponsoring organisation, BAA plc, the first privately owned airport organisation, illustrating the changes that have occurred as a result of it's privatisation. In particular the case for a commercial model of an airport is confirmed by highlighting the commercial strategy BAA plc has pursued.

This chapter sets the scene for the thesis by presenting the changing nature of the airport industry.

2.1 The definition of an airport

It is necessary to consider a number of existing definitions in order to appreciate all the issues concerned with airport operations and management. Ashford defines an airport as the physical site at which a modal transfer is made from the air mode to land modes (Ashford et al, 1984). This definition highlights the operational issues involved in the airport business, ie the processing of passengers, freight and aircraft between land and air.

In addition to this, an airport is described as a *service system producing services rather than goods*, ie a configuration of resources combined for the provision of goods or services (Ashford, 1984). This broadens the operational definition of an airport to one encompassing the provision of a service. This new definition, whilst not explicitly recognising a customer interface, implies the interaction with a customer base and the need to site the required services, providing them in an efficient manner.

Doganis (1992) offers the following definition:

> "*They (airports) act as a forum in which disparate elements and activities are brought together to facilitate, for both passengers and freight, the interchange between air and surface transport.*" Doganis, 1992:

This definition offers a number of additional important features of the airport business. Firstly the events taking place at an airport are described as being disparate which infers the management of many diverse activities leading to interface issues. Secondly, the words *forum and facilitate* describe the airport as being an area where other organisations conduct their business, leading to ownership / landlord issues with considerable stakeholder implications.

An airport is also described as being part of a wider system, in which it should no longer be considered "a piece of passive infrastructure but the core business of a dynamic enterprise integrated in the regional economy" (Rhinow, 1991).

Ashford (1984) alludes to the particular complexities of an airport environment, suggesting that it differs from other industries in the following way:

- The end product is a service rather than a manufactured good.
- Airports operate in a highly regulated and technologically sophisticated environment.
- Airports operate in a highly political framework.
- Airports operate in an international environment.
- Airports invariably operate on a 24 hour basis.
- Emergencies can be routinely anticipated at any time.
- The services provided to the air traveller or shipper are indirect.
- Investment decisions are relatively infrequent.

Whilst these features can be identified in many airports, the regional airport is often not international and rarely maintains 24 hour operation. In fact the two main London airports have flight curfews over night. The suggestion that investment decisions are relatively infrequent, presents some problems in a time when airports over the world are embarking upon major investment. Ashford suggests these are features exclusive to the airport industry. However, a number of these features may be found in other industries. It should be stressed therefore that the combination of these features leads to the differing nature of airports to other enterprises.

The definitions presented in this section have introduced the issues relevant to the airport business. It has been inferred that the airport operator is concerned with many more issues than simply the operation and maintenance of an airport terminal. An airport operator must consider the following issues in the operation and management of its business:

- Specific operational issues of an airport ie. the logistics of transfering passengers and cargo between land and air modes of travel
- Environmental and stakeholder interface issues
- Customer service issues
- Issues relating to the regional economy
- Management issues

In order to describe the airport business in more detail each of these issues will be discussed in turn.

2.2 Specific operational issues of an airport

The processes that take place at an airport can be divided into three distinct groups (Stratford, 1974; Doganis, 1992; Ashford, 1984) :

- Essential operational services: primarily concerned with ensuring safety of aircraft and airport users. These include Air Traffic Control, telecommunications, police and security, fire and ambulance and runway and building maintenance.
- Traffic handling services: concerned with aircraft cleaning, provision of power and loading/unloading of the baggage/freight hold. Also traffic related with the processing of passengers, baggage or freight through the terminal buildings.
- Commercial activities: Including restaurants, bars, car hire kiosks, conference centres, hotels, specialist shops and customer services.

The degree to which an airport operator becomes involved in each of these activities depends on it's chosen strategy and it's skill base. The airport operator must arrange it's organisation to manage these activities in the most efficient manner in accordance with their corporate strategy.

These operations take place within the physical space of the airport terminals, runways and associated buildings. The physical design of the airport itself has much to do with how it operates, with two basic types of airport described as centralised or decentralised. The centralised structure has a single terminal with access to aircraft gained via piers; the decentralised airport has a number of unit terminal operating with a complete set of facilities to stand alone. Whilst there has been a move toward decentralisation, it remains traditional to centralise the airport organisation (Ashford, 1984). Because of differing operating characteristics and spatial requirements of air and land vehicles, it becomes administratively convenient to divide an airport into an airside or "airplane" part of the airport, and a landside or "people" part of the airport. This is a specific feature of airports and their management.

Ashford (1984) describes the passenger terminal as having three main functions:

- Processing of passengers and baggage
- Provision for the requirements of change of movement type. This is complicated by the random arrivals patterns of passengers who must be aggregated into plane loads.
- Facilitating change of mode

The organisation of a terminal must closely follow operational strategies and requirements of the terminal if it is to function adequately. Therefore the airport buildings must be designed in order to fit their purpose. That is the airport operator must be able to forecast the future type and volume of passengers and baggage that will transit through the airport; the future marketing policies of the airlines in order to plan for peak flows through the airports; the future requirements of their customers etc. It can therefore be inferred that as the airlines and other airport users shift the nature of their business, the airport must respond in order to maintain functionality of their terminal buildings.

Therefore the nature of the airport business cannot be considered in isolation from the environment in which it operates, exhibiting forces, opportunities and constraints on the operations of the airport operator.

2.3 Environmental and stakeholder interface issues

The airport fits within a network of other organisations forming the "Wheel of action" within the civil aviation industry (Stratford, 1974). The diagram developed by Stratford illustrates the complexity of the business in which the airport belongs (see figure 2.1), in which he shows links with the aerospace industry, airline operators, the government and the public community. Within each of these sectors are a myriad of other businesses with which the airport operator must confer. This view is confirmed by Ashford (1984) as he portrays, (see figure 2.2), the relationships existing within the airport as an hierarchical system. This is shown as relying ultimately on the relationship between the airport, airline and user.

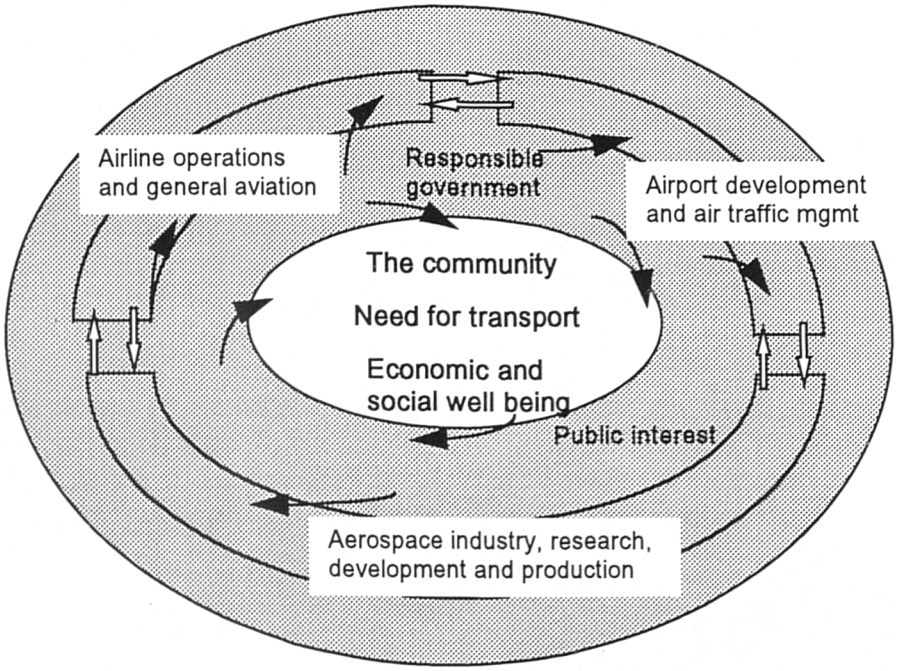


Figure 2.1 Civil Aviation: The wheel of action
Source: **Stratford,** *Airports and the environment*, Macmillan press, 1974.

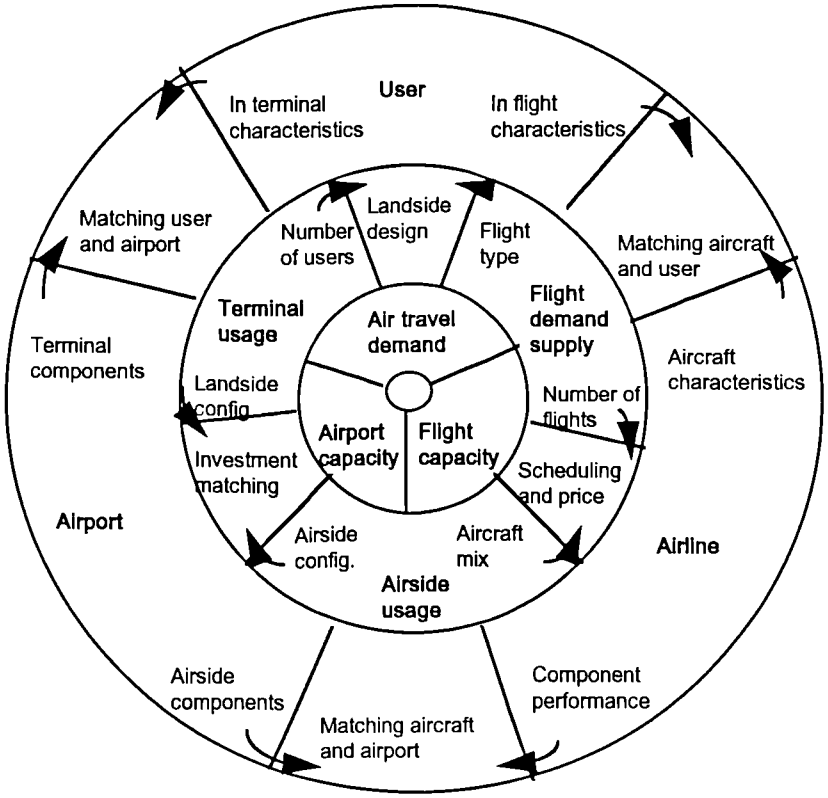


Figure 2.2 A hierarchical system diagram of airport relationships Source: **Ashford et al,** *Airport Operations,* John Wiley & Sons, 1984

"The airport and its administration interface with many facets of the air industry, government, commercial interests, airport patrons and the community in meeting the requirements of each in a balanced way." Wiley, 1981: p21

During the complex business of operating an airport it is necessary to interface with the other businesses operating within the environment of an airport. These include the airlines, handling agents, Civil/Federal Aviation Authority (CAA/FAA), concessionaires, HM Customs and Excise, Immigration, Police, Department of Transport (DTp) etc. (BAA, 1990). These provide additional purpose for the airport's existence but also, amongst others, place additional constraints on the airport operation. For this reason it is vital to manage them and ensure communication to a mutual ultimate goal.

The nature of the business of each of airport stakeholder varies significantly leading to conflicting objectives. For example the aims of the airline and the operator do not coincide: the operator wants to spread demand evenly over the day, whereas the airline wants to maximise fleet utilisation and improve load factors (Ashford, 1984). It is the desire of the airlines to be able to offer their passengers the convenience of increased check in facilities, to accommodate the early and late passenger; however the check in and baggage facilities are very often owned and controlled by the airport operator with limited capacity. This example is one of many where the operations of two parties within an airport conflict and a negotiation must take place to reach a mutually agreeable arrangement.

In addition, the way in which each of these stakeholders responds to their own environment has a direct impact on the airport operation. For example the increase in passenger throughput has led to a general response by airlines as shown in figure 2.3 overleaf. In the past airlines were able to respond to growth by using larger aircraft. However in recent years the growth in aircraft size has reached its peak and the airlines now rely on increased slot for departures at the airports. This places a strain on the air movements and leads to a requirement for additional runway capacity. (Doganis, 1992; BAA, 1990). This issue also impacts the local environment in terms of night

flights and additional pollution; creates a strain on the air traffic control; increases congestion for passengers; and has lead to the development of a new era of wide bodied aircraft to meet future demand. This in turn impacts the airport operator who must adapt facilities to cater for the new wide bodied aircraft. Chammings (1987), in describing the Falklands airport project, suggests that airport development is often "at the whim of the airlines", for example, the introduction of wide bodied aircraft.

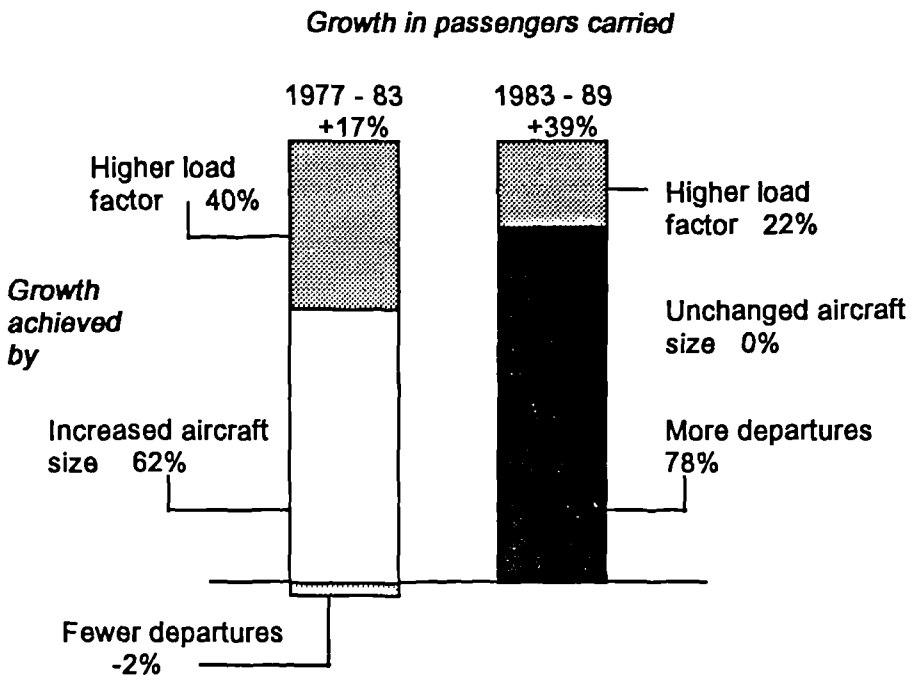


Figure 2.3 Accommodation of passenger growth by AEA member airlines 1977 - 89 (European and intercontinental services). Source: Compiled by Doganis from AEA data, 1992

Doughty (1988) highlights the way in which airlines have increased their transfer service shifting the nature of specific airports from linear to "hubbing" airports. The demand for hubbing at Atlanta airport has increased significantly as it now experiences 75% transfer and transit passengers (Ashford, 1984). The linear layout of many existing airports does not suit the nature of the hubbing activity, where a more circular and central arrangement is required. Development is therefore required at airports to suit the business strategy of the airlines.

The airport operator is also subject to regulatory bodies attempting to control features of the air transport industry. For example the requirement from the Department of Transport (DTp) for 100% hold baggage search and reconciliation with passengers in the event of a security alert, as well as the existing hand baggage search. This has lead to major investigation into the possibility of existing facilities being able to accommodate such a requirement. In many cases major investment will be required in order to increases the existing capacity to cope with the significant increase in baggage security. At the end of the day the airport will have to find a way to achieve the requirement.

Clearly there is a balance between the organisations that co exist within the airport environment. These relationships are also complicated by the fact that many of the partnering organisations may also be considered as customers of the airport operator. This is illustrated in a statement by BAA plc in which they recognise the fact that their business partners are also their customers:

> *"We share the results of these surveys (Quality service monitors) with our business partners - the airlines, concessionaires and government agencies, so that we can make common causes with them in jointly delivering a world class airport service with the final arbiter of our success being the passenger....Also helps us to understand the needs of the companies operating at our airport. In one way or another most are our customers as well as our partners."*
>
> BAA Annual review, 1991

2.4 The airport customer

Ashford (1984) recognises the complex interrelationship between the passenger, the airport and the airline. A change in any one of these has a knock on effect on the others in the triangle.

Operations of airports are closely linked to the aircraft they serve. In the same way, the aircraft are suited to the demand they fulfil. Passengers are not a homogeneous sample, they seek different conditions and needs and therefore place different overall

demands on the system and present different peaks to the system. The air transport industry must be able to service a range of passengers from first class passengers to the economy traveller; regular to first time fliers; and business to leisure passengers. The airport must be able to provide for a spectrum of tastes, needs and perceptions. This impacts many facets of the airport's operations, building space planning and design, as well as the airline and regulatory bodies within the airport environment. The airport operator must balance the needs of the aeroplanes and airlines with the needs of the people, in the past this has not happened (Altobello, 1988).

Clearly, the passenger is not the sole customer of an airport, it is possible to identify and target eight groups of potential customers (Doganis, 1992):

- Passengers - departing, arriving and transfer passengers are likely to have different requirements. In a cargo terminal the shipper and forwarder will take on the same role.
- Airlines - in terms of space and facilities especially those airlines with the airport as their home base.
- Airport employees - a very sizeable market, though their motivation is quite different to the passenger. It is primarily convenience, the ability to do everyday shopping that makes up the requirement for services.
- Airline crews - due to the nature of their work they require specific services.
- Meeters and greeters - people accompanying passengers to and from the airport can be induced into purchasing.
- Visitors - who come primarily for sight seeing.
- Local residents - a frequently neglected potential group of customers.
- Business community - requiring office space, conference and meeting facilities or even warehousing.

Each of these represents a different segment of the market with it's own needs and requirements which must be fully understood and upon which the airport operation will have an influence. One could therefore describe the airport customer as being "multi-headed" creating significant implications for the airport strategist.

In order to sustain customer service levels it is necessary for the airport operator to understand the nature of it's customers and to match the service offered to their needs and values. *"The tastes of the passenger are constantly changing and "Ask the passenger" becomes complex with such a huge array of customers"* (Altobello, 1988; p119). In order to meet the needs of the passenger, the end user of the air transport product, the parties to the *air transport experience* must work together and forge the future development of the industry as a whole.

The airport operator must strategically manage the business to fulfil the needs of this "multi-headed" client and develop within its quasi monopolistic environment (Doganis, 1992).

2.5 Issues relating to the regional economy

So far it has been identified that an airport exists as part of a wider group of organisations to provide a service to its customers. The huge throughput of passengers experienced at an airport must be considered in relation to the region and local industry, in order to appreciate the role of the airport business within the economy. One of the largest airports under development is Chek Lap Kok in Hong Kong which has been designed for the throughput of 35 million passengers per year.

The impact on the regional economy takes it's form in two ways:

- Employment of staff
- secondary generation of revenue through convention and business travel.

A study conducted during the planning of Kansai International Airport simulated that the construction of the airport is desirable for future balanced economic development within the surrounding regions. The increment in employment was estimated at 153,000 and the residential employment in total was estimated at 320,000 by the year 2000 (Suzuki, Sik Pak and Kim, 1989).

Employment is generated by an airport in three ways (Lichfield, 1977):

- Basic employment - Those directly servicing the airport's activities inside or directly connected outside
- Primary or linked industries - Those engaged in manufacturing or commercial enterprises which are not directly related to the airport services as such but are attracted there because of changes in the national or international cost pattern bought about by a new airport.
- Service employment - Those supplying goods and services to those working in the other two categories.

Lichfield (1977) describes a locational dependency indicating how the airport may have an effect as widespread as the national economy: At a local level employment will be generated from airport and urban development; at a sub regional level there is indirect or linked employment and the likelihood of additional industries due to size of market growth; at a regional level the distribution of population means service industry employment is increased and on a national level there are small effects upon the location of employment and the transport system.

The development of an existing airport and the introduction of a new airport is clearly significant upon the local region. Indeed the Liverpool airport redevelopment has been identified as one "*to boost and revitalise the depressed Merseyside region*" (Smith, 1993, p25). Simultaneously, however, Manchester airport in the local region has completed a major redevelopment, likely to attract many of the Liverpool catchmant area. The dilution effects of the significant redevelopment of Manchester airport has resulted in concern over fulfilment of these objectives. Airport planners must consider the balance of regions fighting for passengers as part of a national plan.

In addition to the economic effects the airport can also be considered as central to the tourism plan. Altobello (1988) describes the airport as the gateway to the city, the tourism centre, acting to promote future tourism as show places to the world. If an airport is congested and presents confusion and discomfort to the passenger,

competitive advantage is sacrificed. The Federal Aviation Authority classifies 23 major US airports as seriously congested, which could grow to 40 by the year 2000 as investment is deferred due to lack of funding (Pilling, 1993). Every year US airports need at least $10bn in expansion and development funding; they are currently struggling to raise $5bn. Clearly the balance of regional economic needs must be balanced in order to invest to wisely on a national level.

This leads into the fifth issue identified at the start of this chapter. In order to develop and grow to meet the needs of the customer the airport operator must look to the future and plan strategically with the regional and national planners. The way in which capital is raised in order to meet these needs is one of the primary issues for the airport operator. The nature of the air transport industry currently presents a number of significant pressures for growth and change in the airport industry (Ashford, 1987):

- There is a long term secular growth in demand which shows no sign of reaching saturation in the hear or medium term future.
- The modal vehicles have undergone rapid and significant technological changes.
- The industry is undergoing rapid institutional changes by way of deregulation of airlines and privatisation of airports.
- The growth of hubbing which many view as a transfer of some of the economic costs of transport from the airline to the airport and the traveller.

This has resulted in the demand for alternative generation of investment capital and the search for competitive advantage to improve profit margins. The management of airports has become significant in the realisation of secure growth and survival.

2.6 Management issues

Two significant issues may be highlighted as major in airport management, each with their roots in the changing nature of the airport industry (Doganis, 1992):

- *Should airports be run as commercially oriented profitable concerns?*
- *Should airports be privatised?*

Airports benefit from economies of scale, since they process more and more passengers through the same terminal buildings as demand grows. However this also leads to the need for improved facilities of greater capacity meaning the airports must invest for the future and ensure that they can meet the forecast demand. Figure 2.4 shows the London area forecast indicating a rapid rise in demand for airport services from the period 1982 to 1992, with a forecast to continue on an even steeper upward curve into the next century. During the ten year period from 1980 to 1990, European airports enjoyed an annual growth in passenger traffic of 5% to 6% (Doganis,1992), this has been forecast to increase at a rate of 3.9% in London for the period to 2005 (BAA plc, 1992).

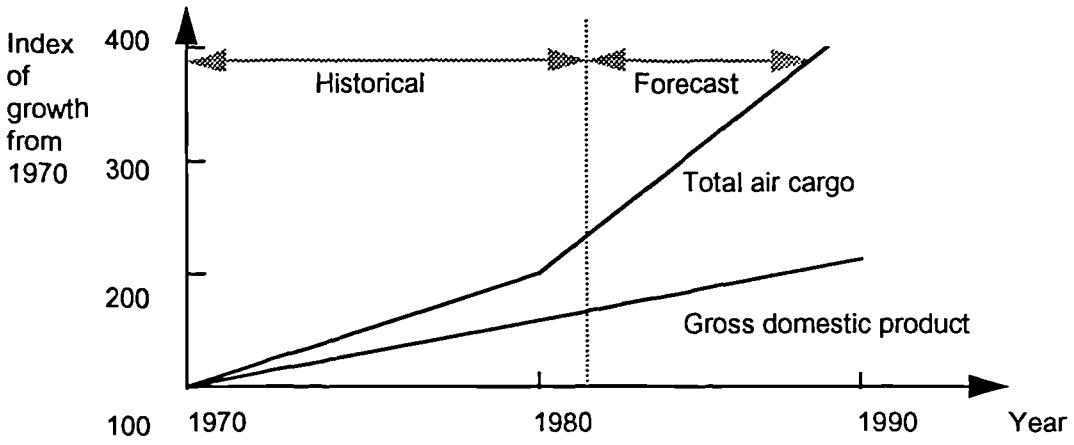


Figure 2.4 Relationship between GNP and volume of air freight.
Source: Lockheed – California, in **Ashford**, *Airport Operations,* John Wiley & Sons, 1984

Figure 2.5 is a conceptualised diagram indicating the dependence of capacity on a hierarchy of possible constraints in the airport system (Ashford, 1984). Therefore the airport must develop over time to respond to the increase in demand in each one of these areas, to reduce the probability of any of these points becoming choke points on capacity. Ultimately, however, the airport operator is constrained by other forces. The delays experienced at present within the airport industry require action from the "*government and airline industry to deal with the delay problem in a strategic way*" (Doughty, 1987, p7).

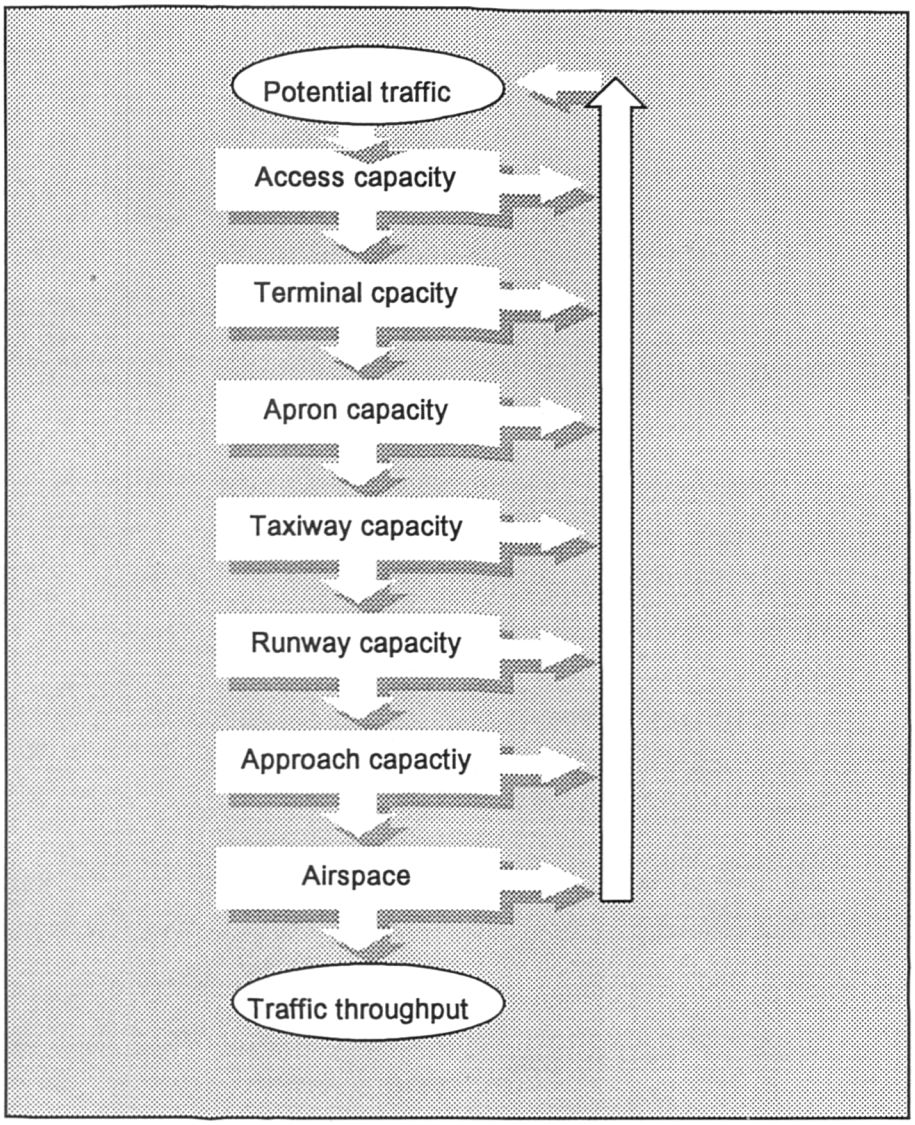


Figure 2.5 Sequential capacity constraints on outbound airport throughput. Source: **Ashford et al,** *Airport Operations,* John Wiley & Sons, 1984

The development of an airport relies on long term planning and availability of funds, which has been driving the discussion on the future of airports as commercially oriented profitable concerns. The difficulty in financial planning is summed up well by Doganis as he explains how the characteristics of an airport generate added dimensions to the problem of cost and revenues:

"...Airport authorities must invest large capital sums in large and immovable assets that have no alternative use, to satisfy a demand over which they have little control except very indirectly. It is the airlines and not the airports who decide where and how the demand for air travel or air freight will be met. Airports merely provide a facility for bringing together airlines and their potential customers. Thus, matching the provision of airport capacity with the demand while achieving and maintaining airport profitability and an adequate level of customer satisfaction is a difficult task. It is made particularly difficult because investments to expand airport capacity are lumpy, increasing effective capacity by much more than is needed in the short term, and because they must be planned long in advance."

Doganis, 1992, p45

The cost and revenue structures of an airport will dictate the availability of funds, subject to government subsidy, for future development as in any other commercially run industry. In order to understand the source of revenue at an airport, the cost and revenue structure will briefly be discussed:

2.6.1 Cost structures at airports

The cost structure of airports vary quite significantly across the world and there is no standard distribution of cost. Figure 2.6 indicates the average cost structures of Western European airports, put together by the Transport studies Group, Polytechnic of Central London (Westminster University).

So in Europe it is inferred that the highest element of cost is the staff cost, but this will clearly depend on the involvement of the airport in the operational duties and how much work is contracted out. In addition to this the capital cost will vary depending on the redevelopment needs and new facility ventures that are under way. The second major element is capital charges, encompassing interest paid and depreciation. Labour and capital costs therefore make up close to two thirds However the pie chart in figure 2.6 is useful as an indication of the average spread of costs seen at an airport.

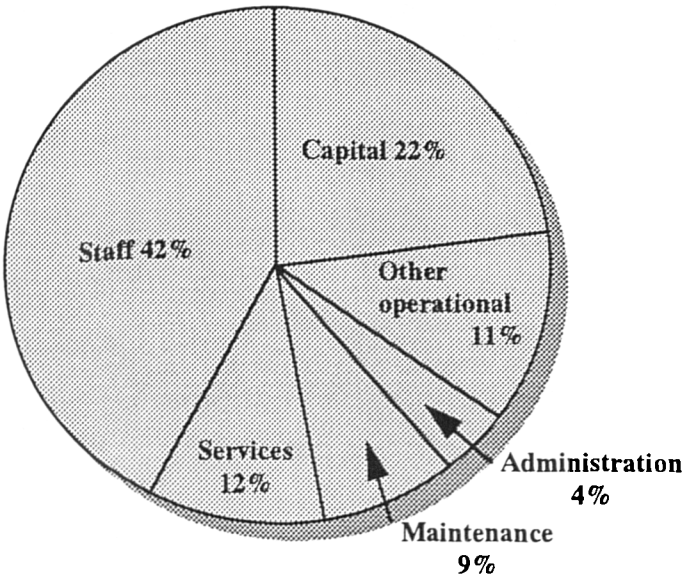


Figure 2.6 Average cost structures of Western European airports
Source: **Doganis** *The airport business*, Routledge 1992, p 46

The significant economies of scale in airport operations has the effect of reducing the cost per unit of traffic as an airport increases its traffic throughput (Ashford, 1984; Doganis, 1992,). However, it is also characteristic that major development programmes push up unit costs. This normally occurs as an airport tries to react to forecasted increases in demand. The result is that for a time the airport is too large for the required throughput capacity. The contradiction between the first and second characteristics illustrate the divergence between the short and long run costs (Doganis,1992). Thus where possible investments should be phased in such a way that jumps in capacity are not too large or too soon.

2.6.2 Revenue structures at airports

Airport revenue is derived from two main sources: Traffic related activities on the one hand and commercial sources on the other. Doganis suggests that the average revenue structures in European airports gives a break down of 44% revenue from commercial activities and 56% from traffic related charges.

Traffic related revenues

These arise from aircraft landing fees, passenger services charges, air traffic control charges and charges related to aircraft parking and hangarage fees.

Landing fees can be allocated by a number of means: A fixed rate per tonne x the unit charge; a rate per tonne with weight break points so that fee increases in steps as total weight increases; a rate per tonne based on the type of flight, so that aircraft on longer flights pay a higher rate; or a movement charge which is a fixed rate independent of size.

The rate is based on air traffic facilities, landing facilities, parking of aircraft on the stand, use of gates, piers etc, take off facilities on departure. Passenger charges are applied either directly or through the airline to recoup terminal charges from those using them.

In order to create an efficient system, charges must reflect the costs which they impose on the airport. The two main cost items are firstly the provision and maintenance of runways, taxiways, aprons and secondly the airport terminal and its associated facilities (Doganis, 1992). It is suggested that the traditional charging structures above do not relate the prices closely to the cost (Doganis, 1992). BAA plc overcame this by introducing a peak related charges in the 1970s, whereby they used a fixed movement charge related to peak periods. The complex charging structure proves more efficient and also encourages the airlines to operate a less *peaky* operation. For example, under this system the charges for an Airbus could vary from £562.84 to £2,096.72 depending on the time of year and day (1990 prices).

Controls are placed on airports to varying degrees. After privatisation the Department of Transport placed an annual limit to increases in BAA plc charges: they could only increase by an amount 1% less than the rate of inflation. Since then the regulation has imposed tighter controls on BAA plc.

Commercial charges

These refer to non aircraft related commercial activities: rents for office space and check in desks; income from shopping concessions of various kinds; car parking; recharging for electricity, water etc. The importance of these commercial sources of income has been increasing as regulations are placed on traffic charges.

The balance of commercial and traffic charges leads to the opportunity for airports to become profit generating concerns, a feature which many, including government, have recognised over the past few decades. An interest in privatising airports to reap the benefits of the increase in demand for airport services has become the subject of much debate.

2.6.3 The privatisation of airports

There has been a change in attitude from the government towards airports over the past few decades: "*there can be no general justification for subsidising airports and air services...*" (HMSO, 1978).

As a result of these changing attitudes, the ties between airports and governments have been loosened in most of Europe (Doganis, 1992). This issue has been at the centre of airport strategic concerns for some time, highlighting the increasing interest in airports and their promising future as private concerns. Very few airports in the world have been privatised, BAA plc was the first in 1987. Historically the private airports have been the smaller airports. However there seems to be a growing trend in the privatisation or part privatisation of airports on an international scale (Doganis, 1992).

Once privatised airports are in a position, subject to regulation from the MMC and such like, to use their new found freedom and exploit the market position they enjoy. Competition between airports occurs in certain sectors as airports try to respond to the needs of their customers. However, they are dependent upon the marketing strategies of the airlines and very often the demographic structure surrounding the airport. On the other hand they display monopolistic qualities due

to their locational characteristics. For example in the UK, BAA plc handles 73% of UK passenger traffic (BAA, 1992).

Despite these figures, North American airports dominate the airport industry in that they provide the vast majority of the world's largest airports (Doganis, 1992). Their dominance is most marked when one looks at the aircraft movements with only a handful of non American airports ranked in the top forty. (AACC, 1990; BAA, 1990). However, when one looks at the number of international passenger movements, the European airports play a much larger part in the airport industry make up. This can be seen in the graph in figure 2.7, where London Heathrow appears the top of the list.

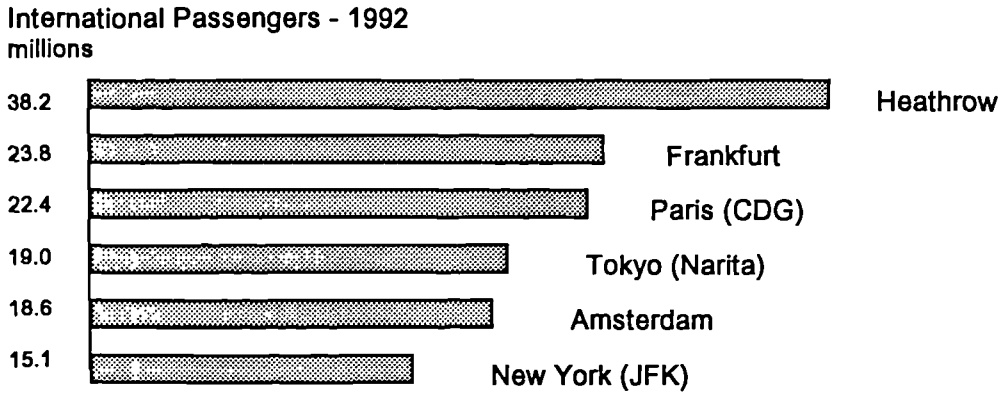


Figure 2.7 International passenger figures for 1992.
Source: BAA, World Class Airports, 1993

Therefore, airports can be said to experience quasi monopolistic characteristics. It was for this reason that airports became labelled as a "rip off" and the strategy of many airports, especially in the UK, has shifted to become aware of customer needs and the delivery of value for money. Airports also have an increasing role to play in sustaining competitive advantage as the use of airports as "hubs", or pure transfer stops, increases and airlines may select their hub airport responding to their needs most fully.

2.6.4 Airports as commercially oriented profitable concerns

As previously inferred, the interest in airports as commercial ventures has probably arisen from the ever improving profit record of the airport industry (Doganis,1992). This has been achieved for a number of reasons, primarily due to the steady increase in passengers wishing to use air transport (Doganis, 1992; Ashford, 1984) and the pressures for alternative generation of investment capital.

Doganis (1992) describes two basic models for an airport: the traditional airport model and the commercial airport model. The former has a primary task to meet the basic and essential needs of the passengers, airlines, freight forwarders and other users. It is normal for government owned airports to follow this model, where airports are designed to speed throughput and handling of passengers.

The commercial model of an airport aims to maximise income from any appropriate activity at the airport, so one can regard the airport as a business opportunity which not only serves it's direct and traditional customers but also a wider range of potential customers including airport and airline employees, visitors, people meeting passengers and local residents etc. Whilst every effort is made to facilitate movement of passengers and cargo through the airport, emphasis is placed upon maximising the opportunities for generating additional commercial income. This even extends to activities which may not be directly related to air traffic such as light industry and leisure complexes. It does however require abundant and flexible spaces. A recent trend has been toward maximising commercial revenues (Doganis, 1992; BAA, 1991) to reduce the effects of regulation on the overall revenue. The degree to which an airport administration pursues a commercial strategy depends on their overall strategy.

Privatisation of airports has had the effect of increasing commercial awareness, leading to profit oriented strategies. The suggested growth in privatisation of airports will lead to an increase in airports following the commercial model as they try to perform in response to their shareholders expectations. Many airport operators however, tend to be instinctively conservative, sticking to the traditional non

aeronautical revenue-earning services and methods, without developing and evolving this important side of their business (Hamon, 1987). For example, this may mean that the airport retains the traditional duty free shops and non branded retailing outlets rather than encourage high street concessions to trade within the airport.

It is therefore possible to present an enhanced definition of an airport to include those characteristics with a possible commercial orientation. A new definition could therefore be:

An airport acts as a forum for passengers and freight to interchange between air and surface transport modes, whilst maximising profit through optimum levels of service.

2.6.5 The airport project

Having reviewed the literature it is evident that the features characterising the airport business create particular project characteristics. Not least of all, the nature of the customer presents problems for project definition. The number of passengers using the airport facilities are on the increase, estimated as doubling every 15 years (BAA, 1993). Also the nature of the passenger is shifting due to market trends and the policy of the airlines to market their services in order to maximise their load factors (plane utilisation). In this respect the airport building owner must rely on forecasts of the type and number of passengers likely to be using their airport facility at least ten years hence. Therefore airport owners "*have no real alternative to creating an airport that can grow in size with demand*" (Egan in Miles, 1993).

Airports are not involved at first hand in the selling of the air transport product ie the flights forming part of a portfolio of products and services. They therefore do not have any direct control over the use of that product (Turner, 1986). This increases the difficulty in forecasting future demand. Compounding the long term forecasting problems are more local flow problems: the flow of passengers through an airport varies according to the flight schedule. The design must balance the high demand seen at peak periods with the reduced demand at off peak periods. The airport designer must facilitate the peak demand within size and cost limits available.

"*We can not give consultants a fixed design brief as the needs of aviation are developing rapidly.....The building must be sufficiently flexible to accommodate these changes.*" (Muirhead in Hayward, 1991). The case for flexibility is argued here on the grounds of the changing usage of the airport with time. This is exacerbated by the long planning periods required for airport facilities, their construction and commissioning; these long lead times result in an increased chance of change to the original concept as forecasts are realised (Turner, 1986). Munich airport spent six years conducting a site investigation taking into account more than 20 sites, before the project could commence at all (Toepel, 1986). At this stage the investment risk is enhanced due to the fact that the *airport facility can serve no other purpose than that for which it was originally intended, nor can it be easily disposed of or moved if it is created in a wrong manner* (Turner, 1986). This makes planning essential.

The airport industry holds a delicate relationship with it's business environment. Changes in the environment effect the short term and long term efficiency of airport facilities, by creating bottlenecks on the ground, for example (Schönrock, 1991). The environment also imposes regulations on the airport business, for example, deregulation of the airline industry. This has lead to largely free market access, non existent capacity restrictions and unrestricted price setting resulting in a boosted market for airports. The airport in return has a major impact on both the natural and business environments, for example:

- Size and location in terms of noise, pollution, traffic etc.
- Design balanced with the local environment
- It acts as the gateway to the country for many foreign passengers.

An airport development combines many different types of projects from civil engineering and building projects to electrical projects. This therefore requires many specialist trades to come together. The Manchester airport development had 15 separate contracts differing in nature involving over 200 contractors and suppliers. The specialist nature of the buildings at airports also require interfaces between specialist trades contractors, leading to the need for finalised information sooner than would normally be the case (Hayward, 1991).

The airport itself becomes the focal point of divergent needs and interests (Marshall, 1988), a few examples of this divergence are:

- Airlines increasingly have competitors from all over the world
- Political authorities are constantly heckled by environmentalists over airport noise, ground and air pollution
- Different categories of passengers take a very dim view of the needs and activities of other passengers.
- The building client is not normally a unitary body but forms from many areas of the airport business and its related businesses. The needs of the participating "client" members are often in conflict and require compromises and careful management.

In addition to this airports must operate as ongoing entities during the development of new facilities creating a number of implications for the airport owner. The project must maintain the levels of customers satisfaction and provide customer care during the entire work period. The works may have to be phased to facilitate the operation of the airport as smoothly as possible; completion is always required as soon as possible to reduce the discomfort to staff and passengers; the need increases to inform the *local community* (consisting of the passengers, staff, local residents etc.) of the work that will be conducted.

Due to the high levels of activity in construction at airports over recent years; competition has been good and airports have enjoyed costs and contractor commitment (ENR, 1991). The future appears to hold similar benefits coupled with disbenefits to consider during the management of airport projects The future trends are (Lipman, 1987):

- Passenger expectations are increasing
- More competition among airports
- Expansion of aircraft fleets by the airlines impacting on the airport infrastructure
- Increased privatisation of airports
- Terminal expansion projects on the increase
- Changing passenger profile as the number of business/transfer passengers increases

- Security is a high priority
- Automated airport flow procedures as traffic through airports increases
- Declining fares
- Time spent at airports by many different customer groups increasing.

It can therefore be seen that the demand for new build and development projects at airports will continue to increase. The problems and issues presented to the airport project manager will not disappear, they must be managed as part of the project process to ensure they do not reduce the chances of project success.

In summary, table 2.1 highlights the characteristics of an airport project from the above discussion. A test of the uniqueness of these features to the airport industry will form part of the research study to devise a model for the project management process within an airport company. The results of this analysis are contained within chapter 9.

This chapter has thus far argued that the airport business is concenrned with four issues. Specific operational issues; environmental and stakeholder interface issues; customer issues and management issues. It has been suggested that the airport business is shifting from one of operational emphasis to commercial emphasis. In pursuit of revenue in order to meet future demand airports are attempting to manage a business responding to customer needs and maximising value. It has been suggested that airport organisations analyse their strategy as any other organisation and respond to the needs of their environment. It has been suggested that the nature of the airport business presents specific characteristics to the airport project.

The remainder of this chapter will discuss BAA plc, the organisation sponsoring this research. BAA plc as the first privatised airport company, displays characteristics in common with the commercial model of an airport and the changes have led to a successful organisation with annual increases in profits and share price.

General characteristic of an airport project
Regulation sets standards to which projects must conform
Night working due to 18 hour plus operation
Locational constraints on space
Significant number of stakeholders
Changing nature of stakeholders' business
Projects often reacting to direct customer request
Constant throughput of people during construction
Working with existing assets much of the time
Project takes second place to operation of business
Many sub project types within one project
Requirement for speed emphasised due to operational disruption during construction
Administration for security at site location
Projects must be designed to grow with demand
Nature of end user shifting - rising expectations
Projects exposed to high environmental profile
Facility can serve no other purpose if abandoned

Table 2.1 The characteristics of an airport project

Source: *Ashford, 1984; Doganis, 1992; BAA, 1992;1993;*

2.7 BAA plc

This research was sponsored by BAA plc, a private airport authority, in an attempt to improve the value for money of their construction projects. In order to place the thesis into the context of the sponsoring organisation, the next section with explain the structure and operation of the BAA plc organisation.

2.7.1 BAA's core business

BAA plc claims to be the world's leading international airport group. In the UK it owns and operates seven airports: Heathrow, Gatwick, Stansted, Glasgow, Edinburgh, Aberdeen and Southampton. Together they account for about 73% of UK passenger traffic (about 80 million passengers a year) and 84% of air cargo. Each of these airports is run as a separate business unit in its own right.

The company's aim is to provide the growing number of airport users with continually improving levels of service in efficient, user friendly airports while ensuring a healthy return on its shareholder's investment. BAA state that this is underpinned by their solid commitment to safety and security and their commitment to improving and protecting the environment around their airports.

In order to achieve this BAA report that it is focusing on its core airport business where its efforts are concentrated in four key areas:

- Airport operations - that is, processing passengers, luggage and freight through the airport. Customer service and productivity are regarded as two sides of the same coin and continuous improvement is sought in each area. To measure their success a Quality of Service Measure is administered by survey throughout the BAA airports. BAA plc plans to increase productivity in terms of passengers per airport employee by a minimum of 3% annually.
- Retail services - BAA hopes to establish a reputation for service, quality, choice and value for money at its retail outlets and thereby maximise its retail revenue.
- Property and related business - In 1988 the group acquired Lynton plc to manage and develop its extensive property holdings. (BAA own 16mft^2 of real estate).

- Major project development - To ensure BAA's capacity continues to match rising demand the group needs to invest in new airport facilities. At present the group spends £250m a year on major new developments and is conscious of the need to continuously improve in this area.

"*BAA sets out to attain world class standards in each one of these core skills*"

BAA Business brief, October 1992

2.7.2 The privatisation of BAA plc

Further to the Airports Policy White Paper of 1985, BAA was turned into a limited company, BAA plc, which was subsequently floated on the Stock Exchange in 1987. It was launched as a single company owning seven airports, each of which became subsidiary companies. At the time of writing BAA plc is the only fully privatised airport company whose shares are traded freely on the Stock Exchange.

BAA plc highlight a number of benefits from being a privatised organisation, the first of these being the financial freedom allowing them to operate on a true commercial basis, with finances planned over a realistic timescale. As a private company the board is solely accountable to the shareholders and this clarity of responsibility is believed to lead to better decision making. The company now believes that it can invest in projects which are justified by the needs of the business where previously investment was sometimes determined by government spending policies. Similarly the company can invest in projects not directly related to core business. This was exemplified for a time as BAA plc diversified into hotels, property and international expansion.

The company can now pay market salaries, which enables them to attract and retain high calibre personnel in key areas. Privatisation also brought about significant changes in the group's management and organisational structure. Delegation of management control to business units has allowed decisions to be taken at a subsidiary level, ie closer to the customer. The proceeding section highlights the major elements of BAA plc's performance indicating a successful transition into a private, profit oriented company.

In the six years since it's privatisation BAA plc has increased passengers by 42%, more than doubled its turnover, more than tripled it's share price and increased profits by 130% (BAA, 1992).

2.7.3 The BAA plc organisation

This section will describe the sponsoring organisation in terms of its organisational structure and the way in which it organises the management of its business. By addressing the organisational issues of BAA in this way it is possible to understand the way in which BAA plc operates and communicates. This will act as the context within which a model for the management of major projects will be developed. In order to investigate the nature of the sponsoring organisation this section will briefly review the models of an organisation and then draw conclusions as to the specific features of BAA plc.

In reviewing the literature on models of organisations that could be used to describe BAA plc, it is concluded that three components may be used to describe an organisation (*Child 1986; Hellriegel 1989; Hunt, 1986; Johnson and Scholes, 1989; Kast and Rosenzweig, 1973; Kleiner and Corrigan, 1989; Mintzberg, 1991; Morgan, 1989*). An organisation consists of a **formal structure** dictating the relationships between functions and departments with the appropriate level of differentiation and integration to achieve the corporate objectives. The formal structure exists within a network of values held by subsystems, departments and individuals forming the **informal structure or culture** of the organisation. The organisation forms a complex interrelationship with it's **environment**, from which inputs are drawn and products and/or services are output. In responding to its environment the organisation will need to adapt and learn to filter the new values, information and strategies throughout the organisational network.

These three characteristics will be used to describe the BAA plc organisation:

The formal structure of BAA plc and it's impact on projects

The organisational structure of BAA appears in figure 2.8. A number of structural forms can be seen through the hierarchy. On a corporate level the organisation operates as a *Holding Company* (Johnson and Scholes, 1989). It is characterised by a set of autonomous business units each retaining their own identity, their own structure. It is really a subset of the diversified organisation with each business unit fully in control of its strategic decisions. The risks of decentralisation within an organisation conducting projects, such as BAA plc, leads to the requirement for an established set of rules between projects and the base organisation (Selin, 1991). Since knowledge is broken up across small units there is a danger that links will not be established for the transfer of this information. Project complexity may require cooperation from staff in several areas of competence, this may cause confusion at the customer interface (Selin, 1991).

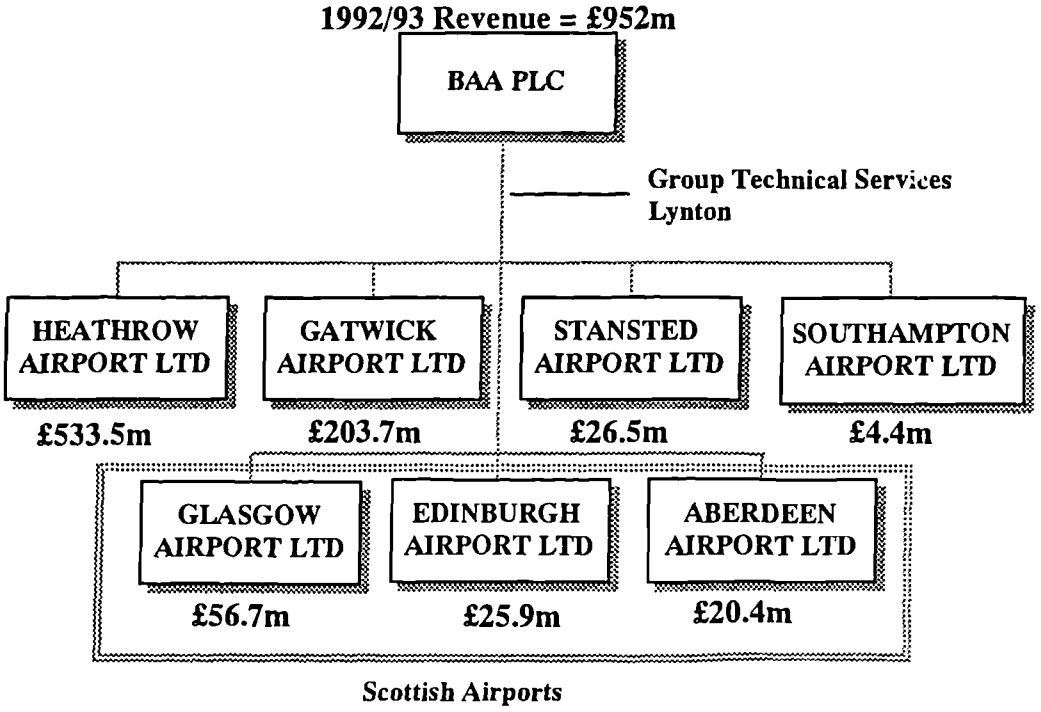


Figure 2.8 The organisation structure of BAA plc
Source: BAA plc 1994

At the business unit level the BAA plc structure operates on a functional basis. The *Functional structure* is characterised by it's focus upon primary tasks (Mintzberg, 1991). It is found in smaller companies or those with narrow, rather than diverse, product ranges. It produces a natural flow of information but can lead to neglect of strategic concerns as managers become over burdened with routine matters. Communication across the functions can only occur by passing information up one functional hierarchy and down the other. It is for this reason that BAA's project structures seek to achieve fluid cross functional communication through a matrix type structure. The *matrix organisation* is a dual authority structure with two or more managers / units make decisions jointly and are equally responsible for the same decisions. The dual nature can arise from work between product and geographical divisions or between functional and divisional structures operating in tandem. It allows quality decision making where interests could be in conflict, however the length of time to make these decision may be longer. It has become more common within BAA to reduce the rigidity of these matrix structures into inter-departmental cross-functional project teams (Cooke-Davies, 1990). This allows a multi disciplinary team to come together for a temporary duration with a specific focus of attention.

BAA plc has therefore arranged its organisation structure in three levels in order to optimise communication and control. In operating as a holding company it could be criticised for creating barriers to communication across the business units and creating unnecessary competition (Johnson and Scholes, 1989). This however is addressed by setting a strong corporate strategy and directing the business through each of the airport businesses. As one moves up the hierarchy the decision making becomes more individual as the matrix organisation and consensus decision making occurs deep within the business units.

The BAA plc corporate culture

Ultimately the behaviour of people within BAA plc and the effectiveness of their combined activities, is crucially determined by the corporate culture. Culture has been defined in a number of ways (Hunt, 1986; Kilman, 1985; Wilkins, 1988;

Lorsch, 1986) resulting in the definition used in this thesis: *Culture can be defined as the shared philosophies, ideologies, values, assumptions, beliefs, expectations, attitudes and norms that knit a community together.* However all the definitions of culture reviewed held the common message that the culture of an organisation includes values and beliefs about the individual, the task, the work ethic, the leadership, cooperation, outsiders and the community (Hunt, 1986).

The cultural network (Deal and Kennedy, 1982), making up the map of interrelationships within the organisation, consists of three main elements: the **origins** of corporate culture, for example the business environment exerting forces on and shaping the culture; **values**, defining the corporate character; **rites and rituals**, living out the culture through the people and heroes acting as a role model to motivate employees and perpetuate the culture.

The commitment to corporate philosophy is enhanced by having a common set of beliefs and a mutual understanding. These also assist in the generation of common values. The culture may also be considered as a control mechanism to channel employee behaviours in the desired direction (Hellriegel, 1986), also the shared meanings, language and feelings can facilitate communication (Saffold, 1988; Sathe, 1983).

Early writers on the subject of culture hypothesised that a strong culture led to increased performance. However, this view is qualified by Saffold (1988) suggesting that these studies assumed a single unitary organisational culture. It is evident that "multiple subcultures" are the rule and a single unitary culture the exception. Saffold discusses cultural dispersion, the degree to which cultural characteristics are dispersed throughout the organisation.

Deal and Kennedy (1982) reinforce this view of the corporate culture being built up of a number of subcultures. They define these as being due to functional, locational and environmental factors within the organisation; educational background and sex. Due to the locational diversification of BAA plc a strong

subcultural level exists characterising the business units. Each airport exhibits its own personality, interpreting the main culture within its own context. In this respect each subculture will have its own values that others do not recognise, it will speak its own language and have different heroes, it will approach problems in its own unique way at its own pace. Virtually all people will participate in several sub cultures to different degrees (Potter, 1989), therefore it is important that the organisation is considered as a whole to realise the synergistic effect of the sub cultures working together (Hunt, 1986).

Deal and Kennedy suggest that the subcultures should be pulled together in order to work in harmony (Deal and Kennedy, 1982), however a balance must be maintained between the positive aspects of competition and conflict between the various sub cultures and the degree to which they harmonise. Thus it is important that organisations recognise the diverse nature of their culture and do not blanket the organisation under one homogeneous culture. The long term objectives of the organisation must be lived out through the business units through strong communication links and common values (Selin, 1991). BAA could be considered to be suffering from the negative effects of subcultures due to the reduced communication and learning across the airport business units.

The culture must respond to the needs of the environment and the way in which the culture is determined often lays in the environmental forces impacting the business. This has most definitely been the case within BAA plc as it has faced an intense period of structural and cultural change over the past four years.

The environmental interrelationship with cultural change in BAA plc

In his study of value systems, Wiener (1988), defines a typology of value systems based on the relationship between the source of the cultural values and the focus they take within the organisation. The typology, presented in table 2.2, shows that values could arise from tradition or from a charismatic character within the organisation and could be based on functional values or purely elitist.

The external pressures and changing environment of BAA have lead to a shift in focus for the business driven by the arrival of a new chief executive. Very quickly the new cultural message was transmitted through the organisation developing new values and beliefs based upon those of one individual. It is clear therefore that, in the typology presented above, BAA falls into the functional charismatic quadrant. The central value system has been built around the injection of new ideas and values regarding customer focus, competition and growth within the core business. The focus of the business has been shifted by the entry of one key figure to the organisation.

SOURCE OF VALUES			
FOCUS OF VALUES		Traditional	Charismatic
	Functional	FT	FC
	Elitist	ET	EC

Table 2.2 Source: **Wiener,** *Forms of Value system: A focus on organisational effectiveness and cultural change and maintenance.* Acad. Mgmt Review, 1988, Vol 13, No.4, p534-545

BAA's environment necessitated a shift in culture and structure in order to survive. "*It is possible for a strongly established traditional culture to turn charismatic under crisis conditions or otherwise watershed organisational events such as corporate restructuring*" (Wiener, 1988: p540).

These organisational changes have allowed BAA plc to develop and grow into *"one of the most successful airport organisations in the world"* (BAA, 1992; 1993). However, the changes have also meant redefinition of scope and values for members of the organisation many of whom are still in a position of flux. Departments are still attempting to establish their position within the overall organisational picture and the introduction of continuous improvement efforts have resulted in ongoing instability in many areas of BAA plc.

One of the most significant changes to the business of BAA plc is the emphasis on customer service and profit generation. This has lead to the emergence of a strong commercial awareness within the business units forming the backbone of the new commercial strategy.

2.7.4 BAA plc commercial strategy

For many decades, passengers travelling internationally have been able to buy goods free of both tax and excise duty. The pricing policies employed guarantee passengers good value for money and also provide a source of revenue to the airport. Over 14 million passengers made duty or tax free purchases at BAA airports in 1992, resulting in an income to BAA of around £140 million.

However, fiscal frontiers between European Community members states disappeared on January 1 1993. Due to the importance of this revenue to the airport companies it has been agreed that airports can continue to sell tax and duty free goods until 30 June 1999, with responsibility for controls handed from Customs to the retailer. BAA, recognising the significant effect this drop in revenue will have in 1999, have developed a new retail strategy to

- Maximise commercial revenue to the group
- Satisfy market demand
- Provide a high level of customer service.

In responding to this strategy BAA has recently completed a significant construction program to introduce shopping malls with an extensive range of high quality retailing activities into their airports. The result is that in terms of sales, BAA is among the top 30 retailing organisations in the UK.

The group plans to double the retail space at all it's airports by 1996 to a target of around 900,000 sq ft representing an investment of £90m (BAA, October, 1992). This has resulted in a considerable project expenditure over the next ten year period. BAA plc have identified "major projects development" as forming a fundamental component of their core business. Over 1000 projects have been planned for the next ten year period with an estimated spend of £3.5bn not including the anticipated

Terminal Five project at Heathrow. If Terminal Five gains planning approval it will go ahead at a cost of £1.1bn with £800m being spent on phase one. BAA plc spends in excess of £300m per year on airport infrastructure. Passenger numbers are doubling every 15 to 20 years, this rapid growth in the business has lead to the requirement for a new terminal every 2 to 3 years. The estimated £3.5bn spend over the next ten years requires careful planning and management of projects to ensure value for money and customer satisfaction. The continued growth of BAA plc is dependent upon the success of these projects in the customers' perception. As competition increases and the market opens up to the air traveller BAA plc must provide valuable facilities by investing wisely and enduring value for money in their development projects.

2.8 Summary

This chapter has presented an airport as a business enterprise with four main issues to manage: The specific operational issues of an airport; environmental and stakeholder interface issues; customer service issues and management issues. An airport exists as part of a wider system in which it forms a network of relationships between stakeholders and customers. The customer has been identified as being a "multi-headed" facet and the identification of eight main customer groups has led to the need for complex analysis of the future strategic direction.

The discussion argued the need for future airport development in order to meet the increasing demand and sustain competitive advantage within its quasi monopolistic position. Government support of these developments has been reducing and airports are considering the benefits of privatisation in order to generate their own profit and experience the freedom to respond to the needs of their business. The reduction in traffic related charges and the profit generating opportunities have led to the development of the commercially oriented airport in which income is maximised from any appropriate activity at the airport.

This introduces the concept of the airport as a business opportunity, serving a wide range of potential customers. In order to operate in this commercially oriented mode

the airport must strive to improve value for money to the customer and reduce it's costs thus maximising the organisation's profit.

The airport operator must therefore identify its corporate strategy to add maximum value to its processes. In analysing the required strategic direction it is necessary to carefully define value relative to the complex network of customers it chooses to serve. This chapter has defined the context within which the rest of the thesis will be developed.

Finally this chapter has highlighted the main features of the BAA organisation, describing it as a three tiered organisation. The holding company arrangement provides the strategic direction to the business units within which teams work together across functional departments to achieve the objectives. The culture of BAA plc has undergone a significant shift due to the charismatic effect of a new chief executive. The new emphasis is on achieving customer service and meeting the needs of the customer through a careful focus on their requirements. Each business unit exhibits its own strong subculture often creating barriers to communication and learning.

A combination of the freedom afforded BAA plc through privatisation and the shifting values of the organisation to respond to the customer needs has lead to a need for achievement of value for money. The airport business must focus on the achievement of customer satisfaction in order to develop and grow. This forms the basis of the thesis, specifically in regard to the management of major projects. Value for money becomes ever important as the capital investment program increases in response to the shift in the business. The remainder of the thesis will be split into two main parts. The first of these will address the achievement of value within the context of a business enterprise; the second part will then focus upon the way in which the management of major projects contributes to the business value.

Chapter three will open this discussion by focusing upon the strategic processes of a business organisation. It will investigate the definition of value and suggest how to strategically manage the business to maximise value.

Part Two

Corporate strategy through multi projects

Part Two introduces corporate strategy, the process by which an organisation implements a strategy in order to improve their competitive position within their industry. The management of multiple projects realises the change process required to implement the corporate strategy.

Part Two is made up of two chapters:

Chapter Three:	Corporate strategy to achieve added value
Chapter Four:	Management of the project portfolio to add business value

3 INTRODUCTION

In Chapter 2 the definition of an airport was developed into one encompassing the elements of a commercially oriented, profit motivated business organisation, as well as the traditional operational issues associated with an airport. As with any other business organisation, an airport manager will therefore be concerned with the long term development of his/her business and the delivery of service to the customer.

The airport business is therefore concerned with adding value through it's processes in order to seek competitive advantage. This chapter will review the concepts surrounding the term value, arguing that the definition of value is user dependent and not an isolated concept. The chapter will then discuss how value can be added to the business through choice of an appropriate corporate strategy.

3.1 Interpreting the customer's value criteria

In seeking to add value to the outputs of a commercial enterprise, the organisation must be able to understand the term value. Value is a term with many interpretations within the same situation. Nevertheless the philosophy of "value for money" is one used throughout the industrial and commercial businesses of the past decade. In attempting to move to a competitively advantageous position an organisation must analyse value from the customer perspective. The following section will review the interpretations of value and illustrate how value has shifted to a customer orientation as organisations find it necessary to compete for position within their environment.

Historically the concept of value has been presented in economic terms, as a ratio of costs to benefits. Thus the primary mechanism to communicate the impact of all value decisions has been money (Johnson, 1990; Ruegg and Marshall, 1990; Dorfman, 1964). However, value has also been inferred as more than simply a straight cost/benefit issue (Miles, 1972; Dell Isola, 1971). It is defined by four characteristics **Use**, qualities which accomplish its use; **Esteem**, features which make us want to own it; **cost**, the sum of labour, material and other costs needed to make it; **exchange**, properties enabling us to exchange it. It is suggested that the definition of value is dependent

upon whether one is looking from the producer's side or from the user's side (Miles, 1972). This broader interpretation of value has utility as it's fundamental attribute, where utility is described as that "property in any object, whereby it tends to produce benefit, advantage, pleasure, good, or happiness...or...to prevent the happening of mischief, pain, evil or unhappiness to the party whose interest is considered". (Bentham, in Zemagrin, 1987).

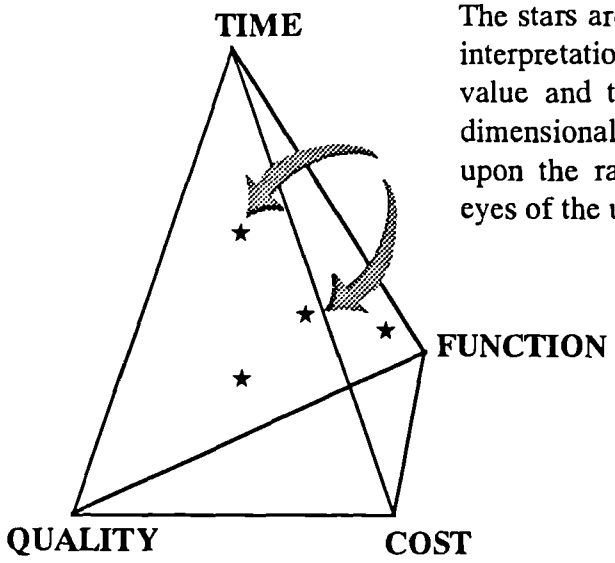
This leads to the definition used in this thesis, that *value is the intrinsic property of an object which has the capacity to satisfy.* Satisfaction is a quality that is difficult to measure, so value becomes a property dependent upon the interpretation of an individual or a group of individuals.

Value has also been associated with an item's ability to perform the necessary functions, where function can be explained as the specific purpose or use intended for something (Copperman, 1989; Chamberland, 1989; Mudge, 1971; O'Brien, 1976). Value will vary from person to person depending on the need and desire for ownership (Kaufman, 1989).

Mudge (1971) adds function as a fourth dimension to the time, cost and quality triangle by defining value as.... *The lowest cost to reliably provide the required functions or service at the desired time and place and with the essential quality.* This can be schematically presented as in figure 3.1. By prioritising and ranking these characteristics the user may define what value means to them for their particular situation. The definition of value will vary according to the nature of the definer and his/her circumstance. This creates particular problems when a number of people are involved in achieving value for a third party, where value may hold varying interpretations amongst those involved in it's production.

It is essential in defining value that the user is consulted such that value, as defined by the user, can be enhanced (Ellegant, 1989). The total interlink between the definition of value and the end user requirements is echoed by Stylianopoulos (1989) as he states

that *"...This is because, in all instances, value is determined by the owner/user."* (Stylianopoulos, 1989: p117).



The stars are positioned to represent different interpretations of ***value***. The definition of value and thus the position within the four dimensional schematic will be dependent upon the ranking of the four factors in the eyes of the user.

Figure 3.1 The fourth dimension to the time, cost, quality triangle, showing the position of value.
Source: Author, 1994

Kelly (1990) discusses the importance of defining the client's value system, ie the network of value relationships within the client organisation, prior to defining the project. By defining the client value system the ensuing design decisions can be audited to achieve value.

Porter (1985) adds to this by emphasising the need to identify the buyer's buyer. ie the actual individual who will perceive the value created by the buying organisation. He identifies use criteria and signalling criteria, the former of which refers to the tangible and intangible factors stemming from the links between the organisation and it's buyers value chain. The signalling criteria reflect the signals of value that influence the buyer's perception of the organisation's ability to meet it's use criteria.

3.1.1 Value as a philosophy

The above discussion presents the view that value is dependent upon a number of variables:

- The particular circumstance of the person making the value assessment
- Interpretation of the term "satisfaction", which is fundamentally a personal expression
- The context within which the value assessment is taking place
- The decision maker's need for ownership of the product /service.

The way in which the value adding activities are assessed must be based on the value criteria of the customer, user or purchaser (referred to as customer for the remainder of the discussion). Only by gaining an understanding of the value criteria of the customer can a business organisation assess it's own processes and define the critical success factors to add value. It is rare for an organisation to serve a sole customer and the normal case would require the business organisation to assess a variety of customers' value interpretations in order to make an assessment of the combined value criteria.

It is more than likely that the value criteria of the different customer groupings will conflict with one another and compromise and prioritising must occur in order to add value in the optimal way. This may mean that the customer groups themselves will be prioritised, forming a hierarchy of customers of increasing importance to the business; or it may be a case of assessing all the value criteria of the customer groups and choosing those that will satisfy the majority of customers.

The definition of customer can also be expanded to one encompassing the internal customer. Each of these internal customers will form linkages with different external customers and therefore will reflect a similar hierarchy. These internal customers will have differing value criteria dependent upon the segment of the market to which they respond and also their own personal values.

It is important therefore to maintain a thread through the hierarchy of the value system such that all members of that value system have a common aim. Therefore the value criteria of members lower in the organisation should reflect those of the senior members, which in turn reflect those of the "customer". This is particularly important in terms of defining a project concept.

It could be argued therefore that the organisation must take on a philosophy of value, that is to base all actions and decisions upon the customers' value criteria. It becomes a combination of managing value throughout organisational processes and more importantly defining what value actually means to the customer. Due to the complexity of the customer hierarchy, the internal processes and the linkages throughout the value system it is important that each person within the organisation takes responsibility for adding value to their own part of the process whilst ensuring that it adds to the benefit of the whole.

3.2 Interpreting value through strategic management

Figure 3.2 suggests the interrelationship of strategic management, competitive advantage and value. This will form the basis of the discussion in this section. It can be seen that the fundamental aim of managing the strategy is to achieve value for the customer of the organisation's products or services. Competitive advantage is a function of value as experienced by the customer group.

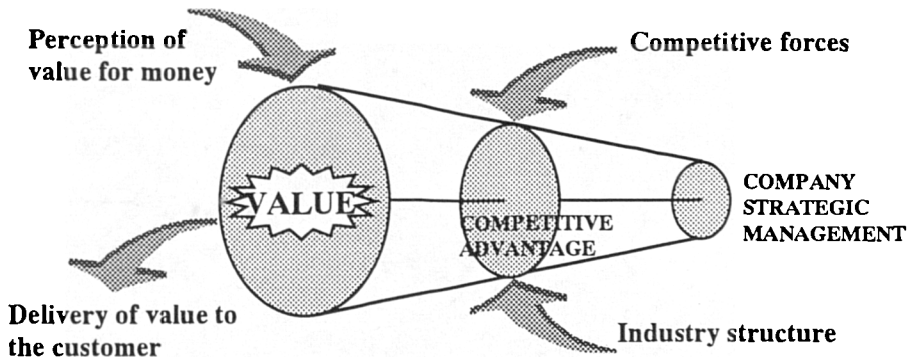


Figure 3.2 Schematic representation of the interrelationship between value, competitive advantage and a company's strategic management. Source: Author, 1994

An organisation exists as a subset of a larger environment, within which it must balance survival and development with competition. In order to compete within its industry structure (Porter, 1980), an organisation must recognise the needs of it's environment and create competitive advantages valuable to the ultimate purchaser of it's output. "*Competitive advantage grows out of the value a firm is able to create for its buyers that exceeds the firms cost of creating it*", (Porter, 1985). Competitive advantage is considered as falling into one of three categories (Porter, 1985):

- Cost advantage - dependent upon a firms cost performance in relation to it's competitors. *eg: A low cost distribution system or an highly efficient construction process.*
- Differentiation - the uniqueness of something that is valuable to the firm's customers. *eg: The procurement of high quality raw materials or services or superior product design.*
- A combination of cost advantage and differentiation.

An organisation can systematically analyse it's customer needs in relation to it's existing capabilities and therefore assess the strategic direction to place them in a position of competitive advantage. In order to establish the direction in which the business can optimise development and add maximum value, the organisation must understand its environment and match this with it's distinctive competencies (Andrews, 1991).

The analysis of the environment and the options for development are held within the process of strategic management, a systematic process to achieve the analysis, choice and implementation of a corporate strategy. Johnson and Scholes (1989), however, discuss the danger of presenting the strategic management process as an orderly sequence of events and instead refer to the process as a framework not to be used as a prescription but rather as a number of items which require consideration in the formulation of a strategy. The three main elements of this framework are **strategic analysis, strategic choice and strategy implementation.** These will be used to describe the strategic management process.

Strategic analysis involves the strategist in seeking to understand the strategic position of the organisation; the strategic choice formulates the possible courses of action, their evaluation and choice between them; and finally strategy implementation is concerned with planning how the choice of strategy can be put into effect. The required tasks at each of these stages is outlined in figure 3. Each will be dealt with separately in the following text.

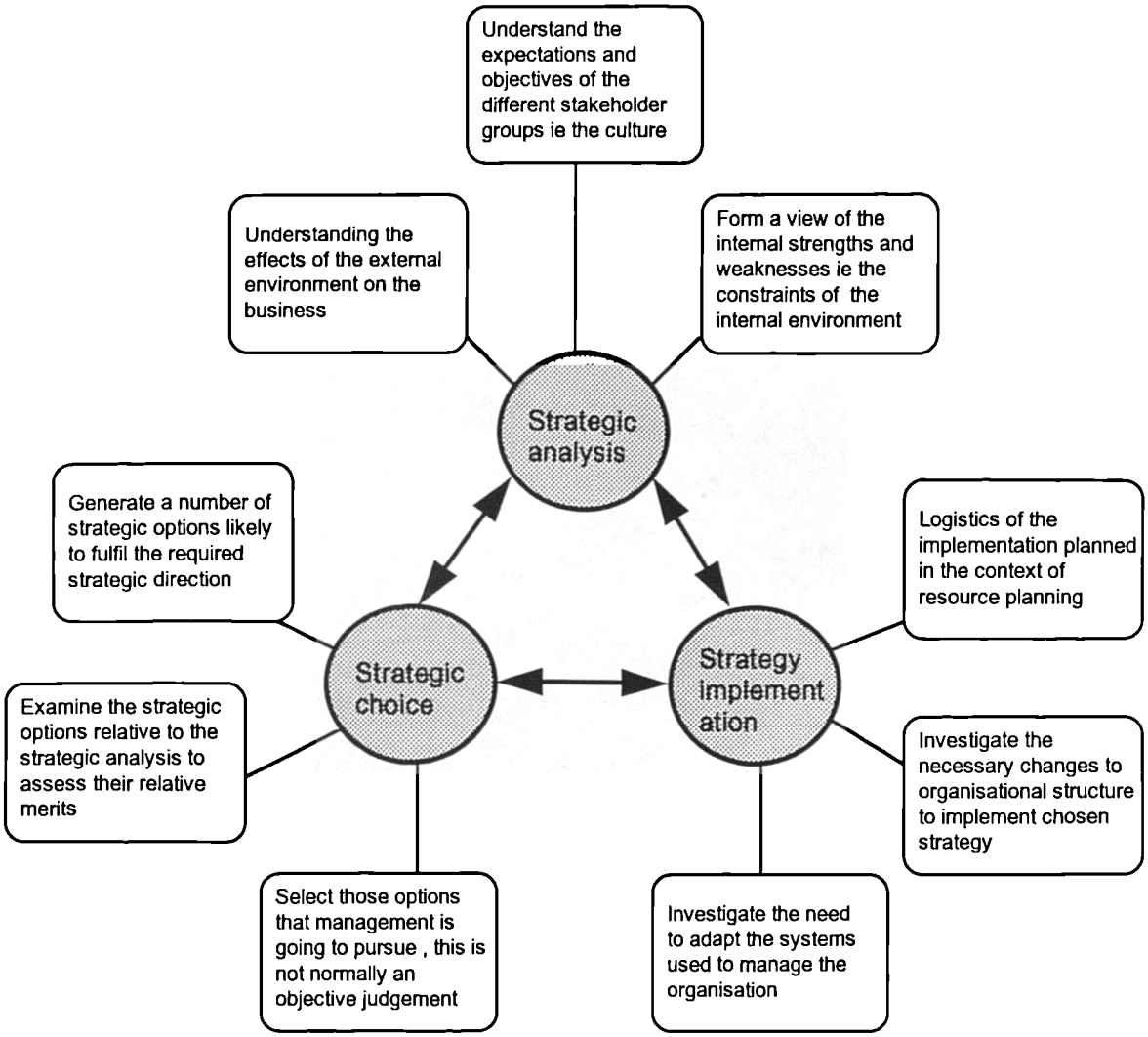


Figure 3.3 A summary of the elements of strategic management. Source, Adapted from: **Johnson and Scholes,** *Exploring corporate strategy, text and cases.* 1989, Prentice Hall.

3.3 Strategic analysis

Johnson and Scholes (1989) explain strategic analysis as consisting of three elements:

- Understanding the effects of the environment on the business
- Understanding the expectations and objectives of the different stakeholder groups
- Forming a view of the internal strengths and weaknesses ie the constraints of the internal environment.

Strategic analysis seeks to understand the internal and external environment of the organisation and establish a strategic direction ie a view of the future state of the organisation. In its basic form the organisation must identify areas that will give them competitive advantage. A useful tool in this analysis is the value chain of Porter (1985) in which the organisation is presented as a series of value adding activities.

3.3.1 The Value Chain as a tool for diagnosing competitive advantage

This analysis relies on the observation of an organisation as a series of activities each contributing to the competitive position of the organisation. These activities form the building blocks by which the organisation creates a product or service valuable to its customers. The value chain, seen in figure 3.4, represents this analogy by splitting the activities into primary and support activities. The primary activities, listed along the lower half of the value chain, are those which are directly involved in creating value for the buyer such as assembly, parts machining, construction of a facility. The support activities, spanning the value chain in the upper half, are those which support or make it possible to achieve the direct activities.

Everything a firm does should be captured in a primary or support activity. These value activities are not totally independent and are related by linkages within the value chain, which themselves lead to competitive advantage when optimised and coordinated (Porter, 1985). Linkages arise from the fact that the same function can be performed in different ways and the performance of direct activities is improved by greater efforts in indirect activities. Clearly management of these linkages gives a sustainable source of competitive advantage.

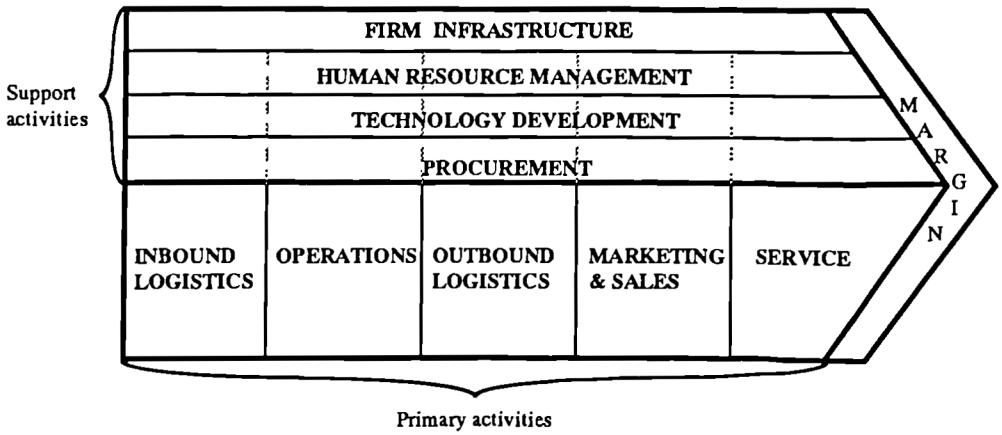


Figure 3.4 The generic Value Chain
Source: **Porter**, *Competitive Advantage, creating and sustaining superior performance*. The Free Press, 1985, p37

An organisation's value chain is embedded within a larger stream of activities which Porter (1985) identifies as the value system (Figure 3.5). Therefore there are linkages between the value chains of a firm and its suppliers and buyers. The outbound logistics of the supplier provides an inbound logistic for an organisation, the way in which this linkage is managed will influence the value of the final output of the value system. Producing a product through the activities of the value chain that will add value to the next value chain in the process, will add competitive advantage through the system. This will arise from the fact that the product will be of more value to the buyer's value chain.

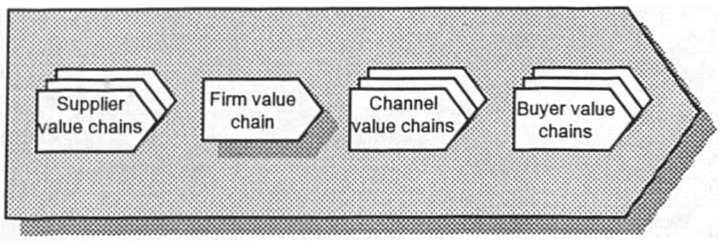


Figure 3.5 The value system of a single industry firm
Source: **Porter**, *Competitive Advantage, creating and sustaining superior performance*. The Free Press, 1985, p35

Analysis of the value chain, and the value system within which it exists, is a systematic way of examining the activities within and between firms. The configuration of this system is shaped by four scope characteristics (Porter, 1985):

- Segment scope: The product varieties produced and the buyers served
- Vertical scope: The extent to which activities are performed in-house
- Geographic scope: The range of regions, countries, or groups of countries in which a firm competes with a coordinated strategy
- Industry scope: The range of related industries in which the firm competes with a coordinated strategy.

The degree to which each one of these segments is pursued must be suited to the needs of the customer; an organisation's differentiation stems from how it's value chain relates to it's customer's/buyer's value chain. This interrelationship is determined by the way in which a firm's product is actually used by the customer.

Figure 3.6 indicates the complexity of the interrelationship between the buyer and the producing firm. "*The value a firm creates for a buyer is determined by the whole array of links between the firm's value chain and its buyers value chain*"(Porter, 1985: p132).

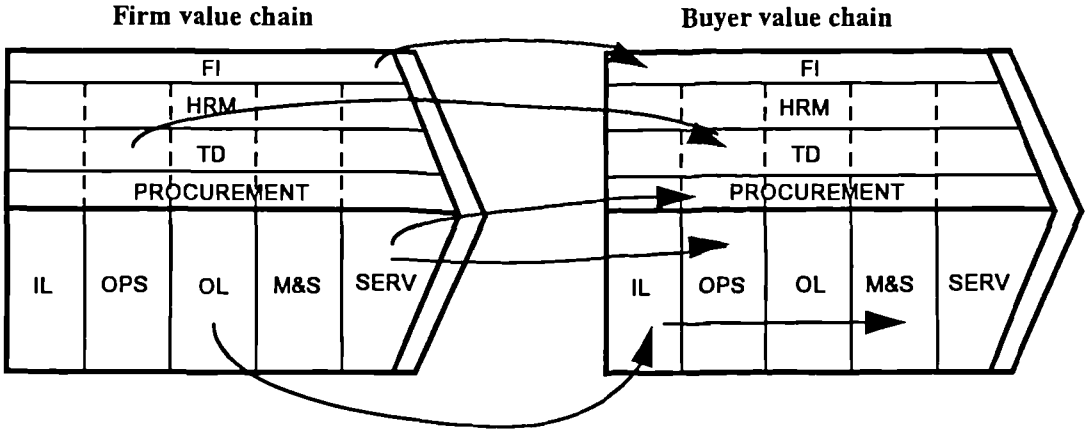


Figure 3.6 Representative linkages between the firm and the buyer's value chain Source: **Porter**, *Competitive Advantage, creating and sustaining superior performance*. The Free Press, 1985, p133

However this complexity also means more direct and indirect linkages, which leads to more possibilities for differentiation and thus the creation of added value to the process. This relationship is discussed by Norman (1993) in which he presents a new strategic paradigm. Norman (1993) refers to strategy as the art of creating value, the art of positioning a company in the right place on the value chain. He has gone on to redefine a value creating system where different actors work together to *co produce* value:

...what we normally think of as products or services are really frozen activities, concrete manifestations of the relationships among actors in a value creating system. Norman, 1993: p68

This new value paradigm is described as that in which a company must create a dialogue with it's customers in order to repeat good performance over and over and keep it's offerings competitive. Not to create value, but to mobilise customers to create their *own* value from the company's various offerings. As these offerings become more complex so do relationships. The principal strategic task of an organisation becomes that of re configuring it's relationships and business systems.

Norman discusses that companies must reinvent offerings to create a better fit between the companies' competencies and value creating activities of it's customers. Analysis of the organisation's internal value chain will allow the isolation of areas that add no value to the process and those areas that may be enhanced in order to increase the value of the final product, the process and/or linkages to achieve the final output.

The analysis of the value system and the environmental forces surrounding the organisation conducted during strategic analysis will lead to a number of options available to the organisation in pursuit of its desired competitive position. It is necessary for the organisation to consider each of the options available in pursuit of competitive advantage and select those most suited to it's resources and

competencies. The strategic choice stage of the strategic management process facilitates a shift toward the strategic direction to enhance value added.

3.4 Strategic choice

Strategic choice is the second element in the strategic management framework. Johnson and Scholes (1989) identify a three main activities to complete the choice of the most suitable strategy for implementation. These are:

- Generating a number of strategic options likely to fulfil the required strategic direction
- Examining the strategic options relative to the strategic analysis to assess their relative merits
- Selecting those options that management is going to pursue.

There exists an optimal set of internal and external contracts which define the *ideal strategic position* (Reve, 1990). Reve (1990), presents a model of strategy connecting the strategic core and strategic alliances (see figure 3.7).

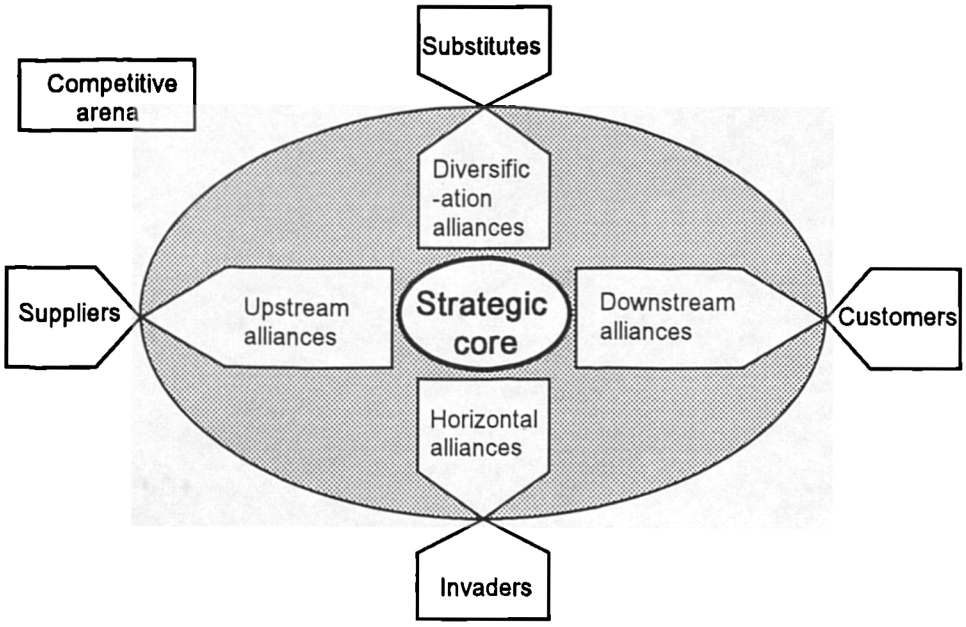


Figure 3.7 Integrated model of strategic management Source: **Reve,** *The firm as a nexus of internal and external contracts*, in The Firm as a Nexus of Treaties, Aoki et al, SAGE Publ. 1990

These are related to internal and external contracts respectively. Strategic management, according to this model, is the alignment of strategic core and strategic alliances to obtain sustainable competitive advantage. It relies on drawing efficient boundaries around the company to ensure that it only diversifies into areas that add value by being part of the internal make up. It is the task of the strategists within an organisation to develop this optimal strategy by considering all alternative options.

Using Reve's model to illustrate some of the options, it is possible to identify four types of expansion paths: Downstream vertical integration, upstream vertical integration, horizontal integration and diversification:

- Downstream integration means developing ties of coordination with customers
- Upstream integration means developing ties of coordination with suppliers
- Economies of scale can be obtained through investments in internal production capacity and growth, but a quicker route is through horizontal integration by mergers and acquisitions (Reve, 1990)
- Economies of scope through diversification, when common skills are shared or utilised jointly ie synergy

It is the way in which the organisation defines these boundaries that characterises the value system and the interrelationships between the different organisations within it. The strategic choice will relate fundamentally to the nature of the business and the industry within which the organisation resides. The nature of the chosen strategies will impact the organisation through the implementation stage. The organisation may only adapt and develop through the final stage of the strategic management process, that is the implementation of these strategies.

3.5 Strategy implementation

Johnson and Scholes (1989) refer to the implementation process, the final element of the strategic management process, as consisting of three elements:

- Investigation of the need to adapt the systems used to manage the organisation
- Investigation of the necessary changes to organisational structure to implement the chosen strategy
- Logistics of the implementation planned in the context of resource planning.

This stage is intimately related to communication and the way in which the strategies are filtered down the organisation impact the success of the implementation. Three levels of strategy can be defined (Johnson and Scholes, 1989; Bowman and Asch, 1989). These levels are described in table 3.1.

It can be recognised that the strategy can and should be split into a hierarchy of increasingly detailed strategies as one moves further into the organisation. Each level of the strategy lays down how the sub strategy shall fulfil the main strategy. This allows the main strategy to be fairly broad whilst reaching full definition at departmental and functional levels.

Strategic Level	Characteristics
Corporate level	Concerned with the types of business in which the company should be involved. With which businesses to acquire or divest. With what resources should be allocated to which businesses. Portfolio analysis Decisions about diversification and the primary structure.
Competitive or business level	Concerned with how a business within the corporate whole can compete in a particular market.
Operational level	Concerned with how functions within the business units can fulfil the organisational strategy.

Table 3.1 The strategic hierarchy within an organisation

The involvement of all levels of the organisation in the implementation of strategy is promoted as the most effective mechanism by which to translate the strategy into action (Lupton, 1971;1991; Nonaka,1988; Hayes, 1985). It is considered appropriate to develop a mechanism for allowing employees in the lower levels of the organisation to develop their own strategies in response to the broad strategies set by the board (Lupton, 1991). It is therefore necessary for the organisation to set up a communications plan to ensure that the strategic message passes down through the strategic hierarchy without distortion. It is for this reason that the strategic plan has evolved. Strategic planning can be defined as the organisational work and process through which purpose, vision, missions, objectives, major policies and key goals are developed in a systematic way.

The mission statement is an expression of the organisational vision and thus important for implementation. Johnson and Scholes (1987) state that....*mission describes the attitudes and expectations about scope and posture of an organisation...A mission is a visionary view of the overall strategic posture of an organisation and is likely to be a persistent and resistant influence on strategic decisions.* The mission statement therefore provides a strategic direction for the organisation to follow, moving toward an ultimate objective. Having defined the mission it is necessary to translate this into achievable long term goals against which all short term goals will be evaluated.

The implementation stage realises the corporate strategy. Whilst the stages of the process have been discussed sequentially, the organisation must continuously and iteratively search for way to maximise value as the environmental forces shift.

3.6 Benchmarking world class standards

Whilst competitive analysis is useful in terms of identification of strategic direction and customer need, it tends to encourage management to meet the competition as they exist today, rather than as they will exist tomorrow (Walleck, O'Halloran and Leader, 1993). The technique of benchmarking, on the other hand, goes beyond competitive analysis, looking further than the products to the operating and management skills that produce

the products. Benchmarking uses a systematic process to identify gaps between practice in "excellent" organisations and those in the host organisation; to analyse techniques to close the gap then implement those changes (Codling, 1992). In this way the competitive analysis actually targets the way in which the competition achieves advantage over them and can improve beyond the current perception of excellent.

Benchmarking is a process for learning from the practice of others, internally or externally, who are leaders in their field or with whom legitimate comparisons can be made. It first identifies the managerial processes that a company needs to improve, then selects other companies that are known to perform analogous processes with outstanding results and finally measures in detail how they perform them. Benchmarking is usually conducted by line personnel who actually implement the changes within their own area. Thus knowledgeable staff are used to develop their own areas of the business.

The benchmarking process comprises three main steps, forming a cyclical process. It forms a typical problem solving process identifying and analysing root causes, breaking each down into small parts to make it more manageable.

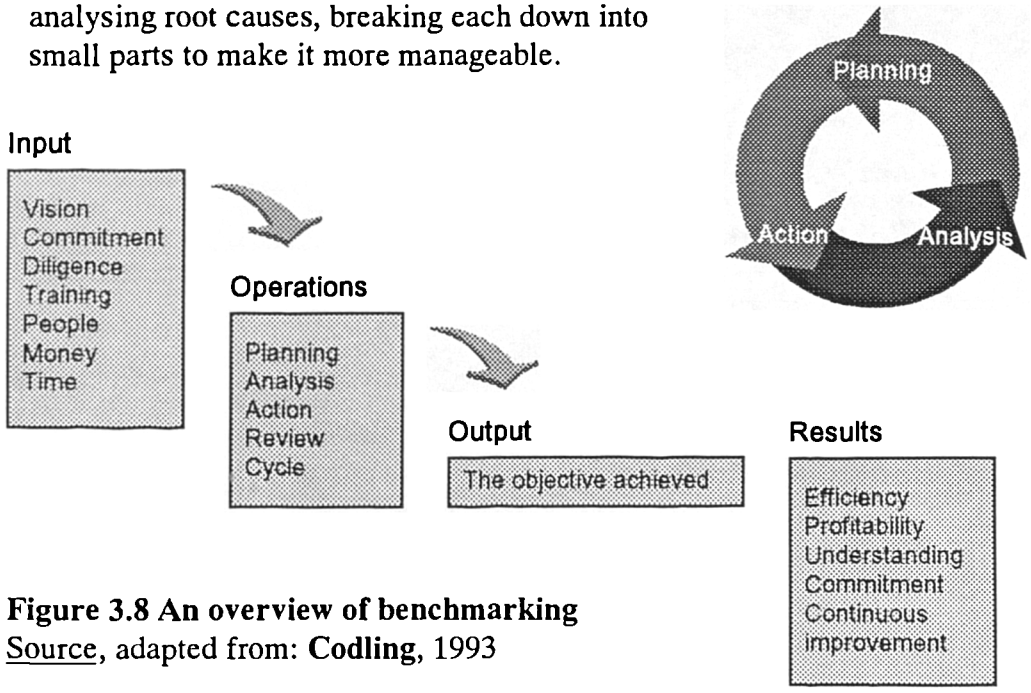


Figure 3.8 An overview of benchmarking
Source, adapted from: **Codling**, 1993

Walleck et al (1993) identify five areas that must be understood in order to describe most operational processes:

- the linkages to partner's processes
- the physical configuration of the process
- coordination of product and process design
- people management
- the use of supporting procedures and systems.

By addressing these areas through a benchmarking process, areas of value added within the operation of the organisation under may be identified.

3.7 Summary

This chapter has reviewed the definition of value concluding that value is not an isolated concept, but one that is held within the perception of the user and is dependent upon the circumstance in which the person finds him / herself; interpretation of the term satisfaction on which value definition is based; the context within which the value assessment is taking place and the decision makers need for ownership. Value therefore must be defined specifically for each set of circumstances. It has been concluded that the complexity of the internal and external airport "customer" leads to the need for value to become a philosophy of the organisation.

In order to relate the strategic direction of the organisation to the customers interpretation of value the organisation must analyse its environment and develop through the implementation of strategies. This is achieved through the process of strategic management, an interrelationship between strategic analysis, strategic choice and strategy implementation. The interpretation of strategic management by Johnson and Scholes (1989) has been used as a framework to discuss the characteristics of corporate strategy. The culmination of each of these should assist the organisation to identify a strategic direction to lead them to a position of competitive advantage. The environmental forces existing within an industry set up competitive forces which must be balanced by the distinctive competencies of the organisation.

The organisation's value chain sits within a much wider value system integrating the value chains of the suppliers and buyers with those of the organisation. The linkages between the value activities within the value system may add to or hinder the achievement of value. The environmental analysis should investigate the value chains of all organisations within it's value system and define efficient boundaries around it's own business.

By creating a cost advantage or differentiating itself from it competitors an organisation can match itself to the buyers perception of value. The environmental analysis and choice of strategy should enable an organisation to identify the most suitable route for development and growth. This may lead to redefining the efficient boundaries within the value system to optimise the scope and scale of the organisation.

Having identified the strategy the organisation must carefully plan the implementation to ensure that all levels of the organisation are working towards the same organisational objectives. By defining a hierarchy of objectives with each level's objectives rooted in those of the level above, the organisation may ensure a continuum of responses to the strategic objective.

In order to respond to this strategy the organisation must develop and grow through changing its processes and values to suit the strategic analysis. Development can only occur if the organisation develops and learns as a whole. Chapter 4 will suggest that the implementation of a portfolio of projects within an organisation fulfils the strategic development required and adds value to the business. The characteristics of projects inherently leads to change, so by matching the project objectives with those of the business, the business objectives are fulfilled.

4 INTRODUCTION

Chapter 3 identified the need to strategically manage an organisation toward its optimum position within it's environment. An organisation relies on it's strategy to survive and grow. However in order to facilitate the corporate strategy the organisation must adapt and change in response the changing needs of the environment. The genesis of change arises from a number of sources both internal and environmental, resulting in actions to achieve the physical change and attitude shift required.

This chapter will review the change processes through which an organisation must go in order to respond to the corporate strategy, indicating the sources of this change and methods for dealing with resistance.

The project is presented as a mechanism for achieving change and the holistic management of a portfolio of projects can lead to the implementation of the corporate strategy. The chapter will review the characteristics of a project that render it a change mechanism and suggest how the organisation may fulfil the corporate strategy by aligning the project portfolio objectives with those of the organisations strategy. It will be argued that projects must be strategically managed within the client organisation such that the portfolio of projects fulfils the requirements of the corporate strategy thus adding value to the business.

4.1 Organisational development in response to the corporate strategy

As discussed in chapter three the strategic management process culminates in an implementation stage whereby the chosen strategies are introduced to the organisation promoting organisational development. Organisational development is a planned, systematic process of organisational change (Hellriegel et al, 1989). It comprises a set of actions undertaken to improve both organisational effectiveness and employee well being.

The change mechanism begins upon receipt of a spark for change. The organisation is said to exist within a sociostructure of other organisations, as the sociostructure converges and the organisations become similar, a spark for change occurs (Fombrun, 1986). Change can be triggered by a number of features: environmental change in terms of complexity or unpredictability; technological change; shifts in the agreement of the goals of the organisation or their means of getting the work done (Starkey, 1988).

Hrebiniak and Joyce (1985) describe a spectrum of change determinants (figure 4.1), arguing that both strategic choice and environmental determinism exist and that there is a spectrum of organisations within the balance. BAA plc, the sponsoring organisation, could be considered as a quadrant II organisation since they exhibit high levels of both strategic choice and environmental determinism. The strategic choice arises due to BAA's freedom to choose their own strategic direction; the environmental determinism since BAA is constrained by external regulators, independently influencing the direction of the airport organisation's business. A quadrant II organisation would enjoy choice despite external forces, but would experience certain rules and constraints. It would generally have multiple means of achieving desired outcomes, whilst the decision making would be affected by clear exogenous factors.

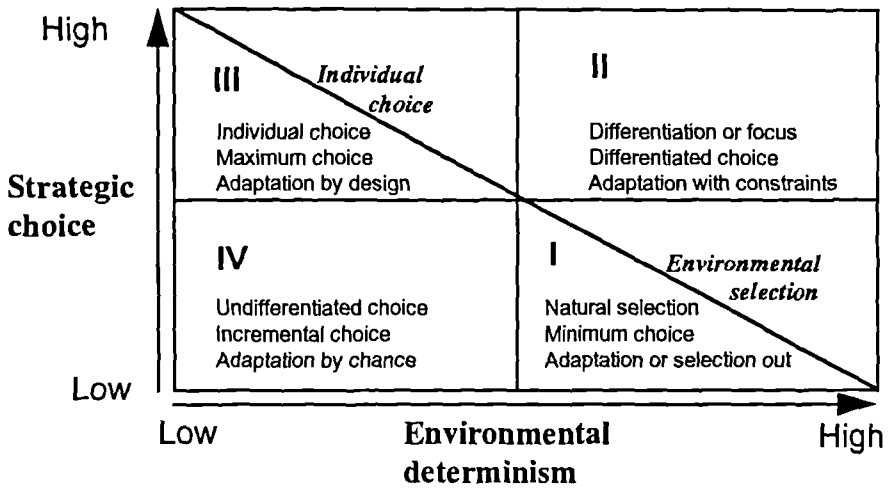


Figure 4.1 Relation of strategic choices and environmental determinism in in organisational adaptation Source: **Hrebiniak and Joyce,** *Organisation adaption: Strategic choice and environmental determinism,* Administrative Science Quarterly, 30(1985): page 339.

While the source of change should influence the specific nature of the change process, it does however follow a sequence of stages, that is, *unfreezing* during which the members of the organisation let go of their current experience; *adjustment* during which the members go through a change of attitude; *refreezing* during which the organisation adapts to its new situation. (Dallevalle, 1991). The issues for consideration through organisational change are summarised in figure 4.2

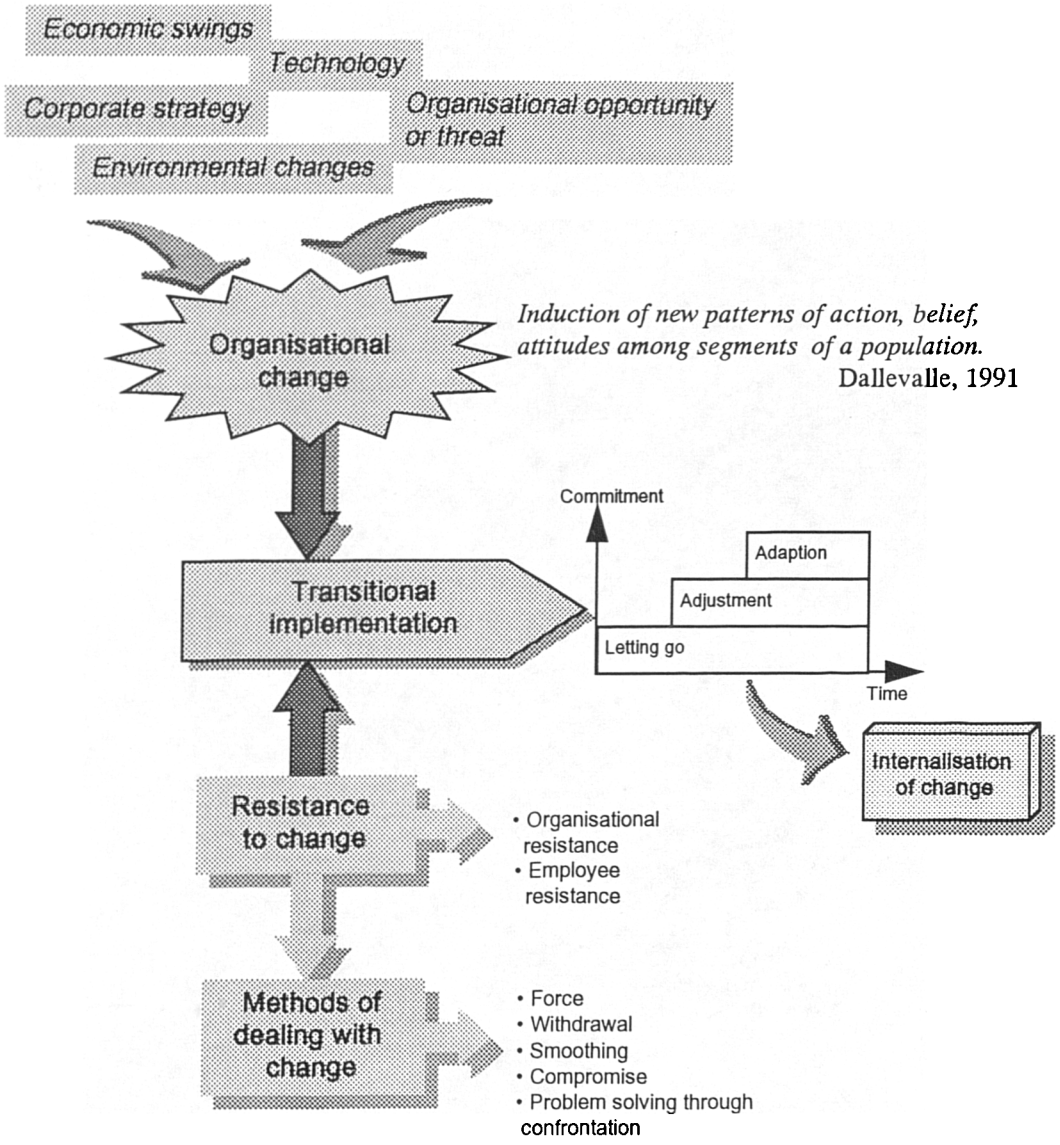


Figure 4.2 Issues in organisational development and change. Source: Author, 1994

Three levels of change have been identified as (Kleiner, 1989; Hunt, 1986):

Developmental - Doing things better, normally in the form of minor every day changes easily implemented

Transitional - Dismantling the old and rearranging to reach the new known state. This is normally well planned and takes place within a set time frame

Transformational - Profound changes, usually driven by shifts in the strategy of the organisation and described as being the least understood.

A large corporate organisation within a turbulent environment will probably experience each of these types of change through it's development.

Organisations may not always recognise the need to change and the trigger may be a combination of many factors. Organisations are characterised by momentum, the tendency to move in one direction and evolve consistently in accordance with a particular perspective, strategy, ideology and mission of their own. The momentum tends to carry it along. Hannan and Freeman (1984) describe inertia in an organisation relative to environmental change. Structures of organisations have high inertia when the speed of reorganisation is much lower than the rate at which environmental conditions change (Hannan and Freeman, 1984).

The very characteristics that give organisations stability, reproducibility and standardisation also generate resistance to change (Kelly and Amburgey, 1991). The implementation of change may be subject to resistance from the organisation itself or the individuals within it (Dallevalle, 1991; Kotter and Schlesinger, 1979; Hellriegel et al, 1989). There is a spectrum of possible reactions to a change process: acceptance, indifference, passive resistance and active resistance. Resistance to change is an inherent part of the change process, seen as purely destructive and presenting obstacles to be overcome. Managers need to accept resistance and manage the process to minimise it's negative effects (Isabella, 1990). The equilibrium between the pressure for change and the resistance against change must be modified to allow the changes to take place and facilitate organisational development (Hellriegel, Slocum and Woodman, 1989). Table 4.1 indicates some of the approaches that may be taken to achieve successful change implementation.

Approach	Commonly used in situations	Advantages	Disadvantages
Education and communication	Where there is a lack of information or inaccurate information and analysis	Once persuaded, people will often help with the implementation of the change	Can be very time consuming if lots of people are involved.
Participation and involvement	Where the initiators do not have all the information they need to design the change and where others have considerable power to resist	People who participate will be committed to implementing change and any relevant information they have will be integrated into the change plan	Can be very time consuming if participators design an inappropriate change.
Facilitation and support	Where people are resisting because of adjustment problems	No other approach works as well with adjustment problems	Can be time consuming expensive and still fail.
Negotiation and agreement	Where some one or some group will clearly lose out in a change and where that group has considerable power to resist	Sometimes it is a relatively easy way to avoid major resistance	Can be too expensive in many cases if it alerts others to negotiate for compliance.
Manipulation and co optation	Where other tactics will not work or are too expensive	It can be a relatively quick and inexpensive solution to resistance problems	Can lead to future problems if people feel manipulated.
Explicit and implicit coercion	Where speed is essential and the change initiators possess considerable power	It is speedy and can overcome any kind of resistance	Can be risky if it leaves people mad at the initiators.

Table 4.1 Methods for dealing with resistance to strategic change

Source: **Kotter and Schlesinger**, 1979

Involving the employees, fully communicating the change and building on old values reflect the thoughts of most writers in this field who consider carefully designed change programs to be the successful route (Dallevalle,1991; Dunsing and Matejka; Hickman and Silva, 1984; Hellriegel, Slocum and Woodman, 1989; Hunt, 1986; Isabella, 1990; Kleiner and Corrigan, 1989; Kotter and Schlesinger, 1979; Lupton, 1971; Schaffer and Thompson, 1992; Zimmerman, 1986).

In summary therefore it has been suggested that the corporate strategy is implemented through a program of changes within the organisation. The change process goes through a cycle of unfreezing, adaptation and refreezing, fulfilling a number of

objectives as defined by the corporate strategy. The organisation must develop through these changes by learning new work practices, new patterns of communication, integrating new members developing new relationships with suppliers and clients. These involve the value system of the whole organisation and therefore it is important that learning takes place on an organisational level (Haveman, 1992).

4.2 Organisational development through learning

The organisational change processes discussed above take place as projects within organisations. When a discrepancy arises between the environment and the company's strategy, management must organise internal projects to resolve the strategic problem (Blejec and Zavodnik, 1992). It is important that the organisation as a whole takes time to reflect on the changes that have taken place (Easterby-Smith, 1991). This can be achieved through organisation learning, the process within an organisation by which knowledge about action outcome relationships and the effect of the environment on these relationships is developed. This requires a process through which an individual's knowledge can be shared, evaluated and integrated with that of others in the organisation (Hellriegel, 1989). A simpler definition of organisational learning is "the process of improving actions through better knowledge and understanding" (Easterby-Smith, 1991). A process by which people learn to learn together.

Organisational learning is not simply a sum of each member's learning, it must be transmitted in norms. In order to achieve organisational learning there must be an environment conducive to learning: A flexible organisation structure, able to recognise and focus on problems by the use of task forces and project groups. Adequate time must be set aside to reflect on what is going on in the organisation, without the obsession with activity found in many change processes. It is useful to create understanding through experimentation and the ability to deal with ambiguity and non rationality. It is also vital to encourage trust and openness, punishment of failed risks will lead to a stifled change and learning process.

Garvin (1993) suggests a series of building blocks for the achievement of organisational learning:

- *Systematic problem solving*: Deming's "Plan, Do, Check, Act" cycle, insist on data before making decisions, use simple statistical tools.
- *Experimentation*: Systematic searching for and testing of new knowledge, this will have the effect of pushing organisations up the hierarchy of knowledge.
- *Learning from past experiences*: The knowledge gained from past failures can be instrumented in achieving subsequent success. Post project appraisals can be a useful tool.
- *Learning from others*: Looking outside one's immediate environment to gain a new perspective, benchmarking is often used to achieve productive results.
- *Transferring knowledge*: Share ideas broadly rather than holding it in a few hands, this may be achieved by personnel rotation.

Organisational learning facilitates the growing insights and successful restructuring of organisational problems by individuals (Fiol and Lyles, 1985). It closes the loop of the change process so that the new systems, structure or operations become part of the value system of the organisation. Internal projects form an important part of the strategy as the tools through which the creative strategic problem solving method is used in the learning process of a company (Blejec and Zavodnik, 1992).

4.3 Organisational change lived out through projects

Through the implementation of change programs and organisational learning the organisation develops and grows along it's desired route according to the strategic direction. The change programs complete the continuum of actions in order to develop and learn as a group and remain competitively positioned in relation to industry competitors. These change programs, made up of a series of projects, can therefore be said to facilitate the corporate strategy (Cleland, 1988).

Project management can be a good way to introduce planned changes into an organisation for the following reasons (Losada, 1992):

- It involves directing corporate efforts towards specific results in every decision making area
- It permits major corporate innovations to be introduced in a gradual and controlled manner
- It is flexible and can be adapted to the peculiarities of the individual company and to the objectives of the particular project involved.

In agreement, Cleland (1992: p316) describes project management as "a building block in meeting competitive global opportunities". Projects provide a focus for the transfer of technology in bringing about operational and strategic change, acting as a transition vehicle to move from concepts to operational and strategic initiatives. By starting, directing and closing down projects a dynamic balance is achieved which is supposed to ensure the continuous development and survival of the company (Gareis, 1992)

Hauc (1988) deduces through his work that project management is linked to strategic management, emphasising that it is almost impossible to think of strategic management without taking into account project management as well. He describes the strategic management process as being made up of a series of projects each with a more intense scope as the time progresses. The process presented by Hauc is shown in a simplified form in figure 4.3, indicating the gradual filter of strategies through the implementation of projects as one passes from the global strategy, through the business unit strategies to the individual projects of the development program.

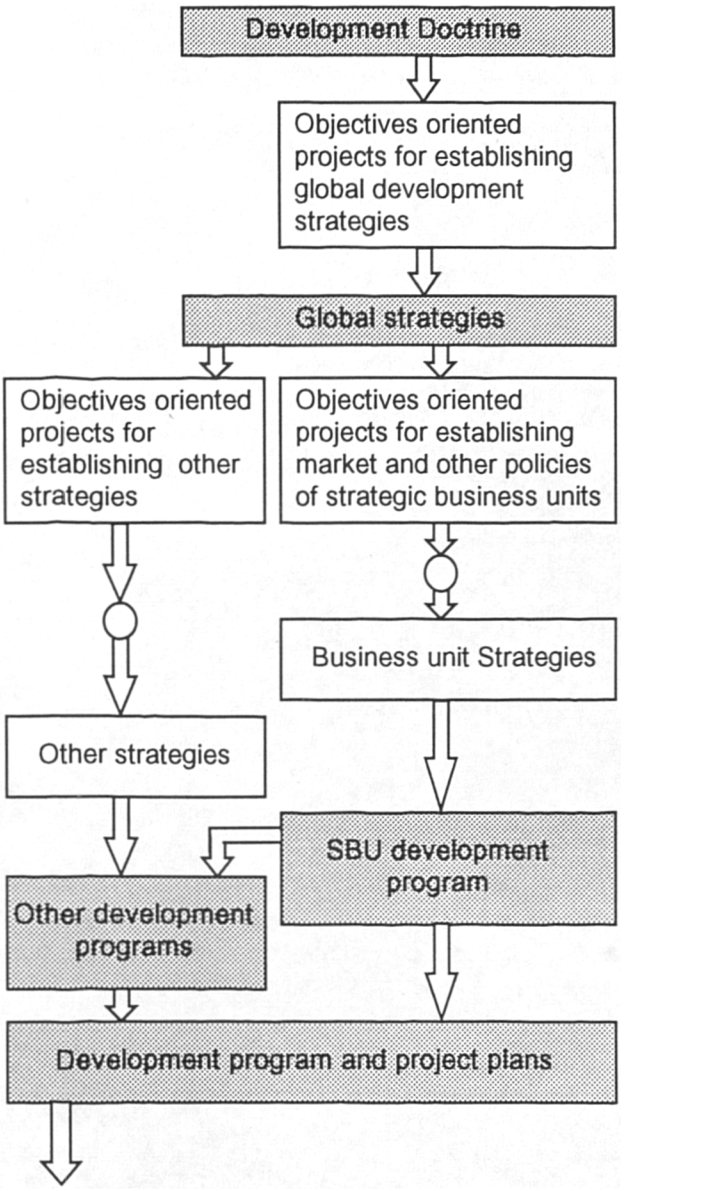


Figure 4.3 Innovation Project Process of strategic management
Source: **Hauc**, *Projects in the process of strategic planning*, From conception to completion, 9th World Internet congress, 1988, p521

This forms an inherent link between projects and organisational development resulting in a number of issues for senior management in order to achieve successful strategic management:

- Projects must form an integral part of the strategic planning process both holistically and individually
- Projects must have their objectives based on the corporate objectives in order to live out the strategy
- Projects are considered as part of a portfolio of projects, holistically adding to the development of the organisation

Each of these issues will be discussed below highlighting the inherent nature of projects to fulfil the organisations strategy. After having discussed these issues the chapter will be concluded by collating the literature to argue the case for the strategic management of project portfolios in the development of an organisation.

4.3.1 Projects as integral part of strategic planning process

The strategic planning process can be considered as a hierarchy of strategic choice elements, with the mission and objectives as the highest level elements (Cleland, 1988; Al Mufti and Cochrane, 1986). They are supported by the other elements: the strategies, goals, programs and projects (figure 4.4a & 4.4b). The strategic decision elements take on the following interrelationships:

- Goals are specific steps along the way to accomplishment of the broad objectives
- Goals are established to reflect the expected outputs from strategies
- Goals are directly achieved through project programs
- Strategies are implemented by programs.

The decisions at the level of *mission and broad objectives* do not require formal techniques since they are few in number and are based on personal values of the senior managers (Cleland, 1988). However there are many options for the projects element so the higher level results should be directly utilised to evaluate alternative projects and programs. Cleland argues that if project evaluation is the key link in unifying the strategic choices, then the evaluation must be integral to the strategic plan.

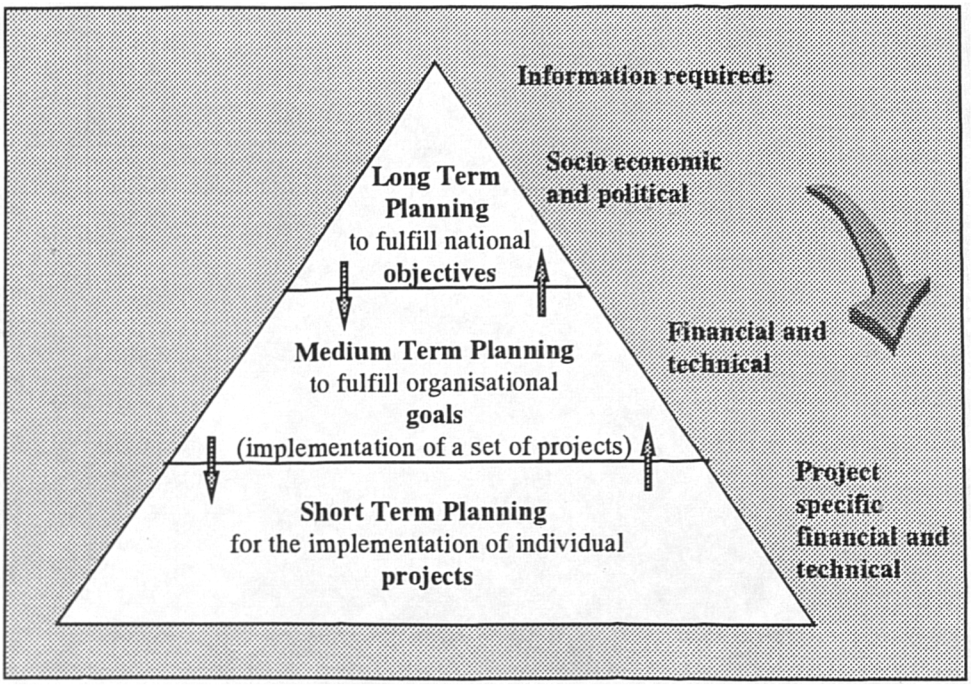


Figure 4.4a Construction Planning hierarchy,
Source: **Al Mufti and Cochrane,** *Construction Programmes in development planning*, 1986. CIB 90, March 1990

Figure 4.4b Relationship of strategic choice elements
Source: **Cleland,** *The role of projects in the implementation of business strategy*. The project management handbook, 2nd Ed. 1988, Van Nostrand Reinhold, p131

In his analysis of strategic project management, Milošević (1989, see figure 4.5) shows an interdependence between the organisational mission and the project objectives during the definition of the project scope. He defines a project management feedback loop in which the purpose of the project management system is established, also the project management system affects the achievements of the organisational mission to the extent of accomplishing these project objectives. The author also sites the importance of the environmental project stakeholders in the achievement of the organisational mission. Growth in the feedback loop is accomplished by project management results enhancing the organisation's mission.

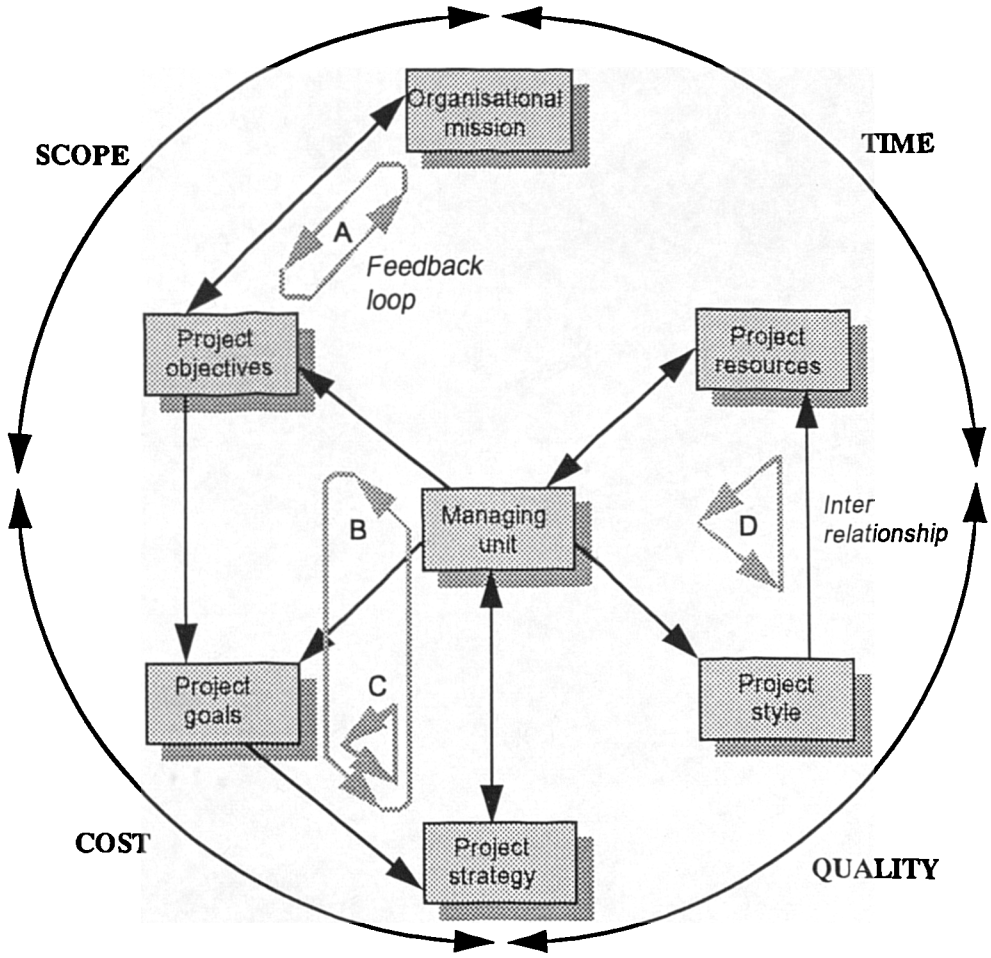


Figure 4.5 Model of a project management system structure.
Source: **Milosevic**, *Systems approach to strategic project management*, Project Management, Vol 7, No.3 August 1989.

In addition to projects fulfilling the strategy as results centred processes, they may also add value whilst going through their process. It is therefore necessary for the owner organisation to strategically manage individual projects to ensure they are procured in the most appropriate way to optimise the value added and thus fulfil the strategic objectives of improved competitive position. This will form the basis of the next chapter which reviews the management of individual projects to enhance project value.

The link therefore between strategic management and project management can be explained as being due to a number of characteristics (Navarre and Schaan, 1990; Grundy, 1990; Stevens, 1992; Reve, 1990):

- Successful project management implementation can improve an organisation's competitiveness
- Projects use resources
- Projects can change the infrastructure
- Projects help maintain a good fit between competencies and customers
- Projects can enhance the perceived value of the business

4.3.2 Project objectives based on corporate objectives

Having identified the interdependence of project management and strategic management in responding to the corporate objectives it becomes evident that all projects must be coherent and compatible with the corporate strategy and the essential characteristics of the organisation if they are to make a significant contribution to company objectives (Losada, 1992).

Projects must be carefully examined to establish whether they are compatible with the definition of the business and its future scenarios (Losada, 1992). Hauc (1992) shows in figure 4.3 two main stages: the first stage establishing objectives oriented projects providing the background for setting the strategy and creating any plans for projects; the second stage exploiting the projects program to realise the strategic goals. Project based budgeting allows business spending to be precisely aligned to business strategy (Cooke-Davies, 1990).

The likely value of major investments must be looked at in a visionary manner (Grundy, 1990) with both a strategic analysis and a financial analysis. In this way the value of the project toward the fulfilment of the organisational objectives can be assessed. Grundy relates Project Value, Business Value and Corporate Value inherently within an holistic analysis as illustrated in figure 4.6, by emphasising the importance of linking all investment decisions to shareholder value. "*Any major corporate investment decision needs to be looked at in a much broader context - it is not simply a project in splendid isolation*" (Grundy, 1990, following action research within several major organisations spanning 20 years).

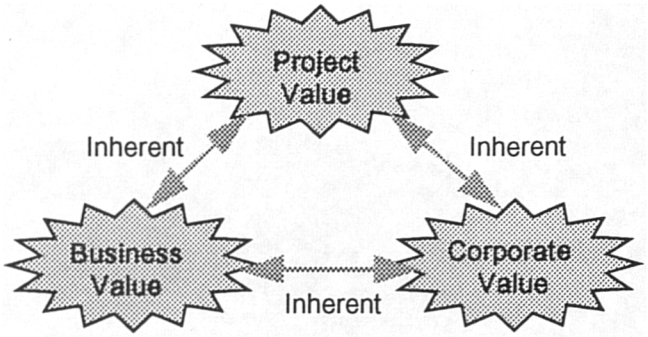


Figure 4.6 The holistic concept of corporate value
Source: **Tony Grundy**, *Strategic Value Management,* Management Accounting, September 1990, p40.

Doctrine and vision provide the objective orientation to the entire process (Hauc and Semolic, 1992). The projects can be considered as the facilities for carrying out the strategic objectives.

In order to ensure that project objectives are based on those of the corporate strategy, a screening process is required. Souder (1988) suggests this should take the form of a multi tiered screening process (see figure 4.7). The screening model allows two levels of project evaluation. The first level weeds out those projects that are least desirable, similar to a coarse sieve. The projects can be assessed by subjective evaluation (Souder, 1988) or by checklists which provide a graphical profile of adherence to certain criteria based on the strategic objectives (Souder, 1988; King, 1992). An assessment of risks and returns can also be made at this

point (Souder, 1988; Ward, 1992). The second level of screening is useful for more detailed information and in depth analysis of a portfolio of projects, where finer discriminations between projects can be made. This can be achieved by a number of techniques including assessment of economic variables (Souder, 1988; Ruegg and Marshall, 1986); risk analysis of the portfolio of projects (Souder, 1988; Ward, 1992; Gareis, 1992); assessment of the project contribution to the short and long term organisational goals (Souder, 1992; King, 1988).

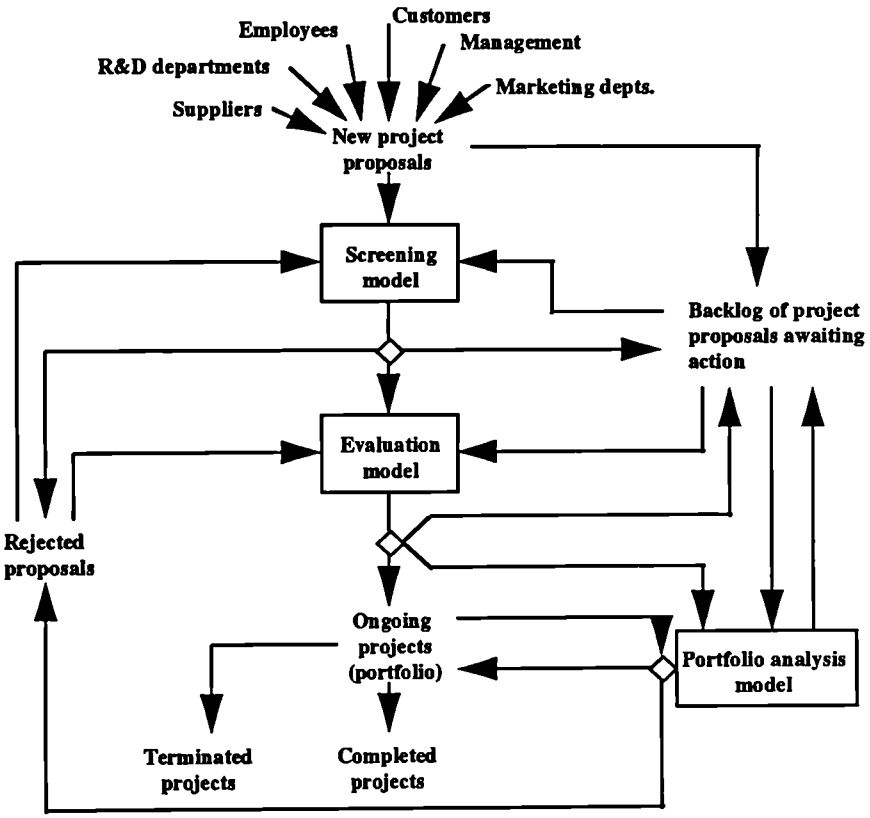


Figure 4.7 Illustration of a project selection decision process
Source: **Souder,** *Selecting projects that maximise profits,* Project management handbook 2nd Ed. Cleland and King (Eds), 1988, Van Nostrand Reinhold, p141.

Financial and strategic tools must be underpinned by shared vision within the management team. To this end Stevens (1992) describes a system of strategic planning for projects through the use of value engineering techniques, leading to an "holistic, radical, creative" approach to the strategic planning of major projects.

Therefore the potential projects are filtered through the application of strategic criteria that are based on the higher level choices that have previously been made (Cleland, 1988; Cleland and King, 1988). Gareis (1992) identifies the need for an integrative perception between projects and the base organisation. Figure 4.8 links the individual projects with the base organisation by means of management of networks of projects ie projects that are performed simultaneously having relationships with one another.

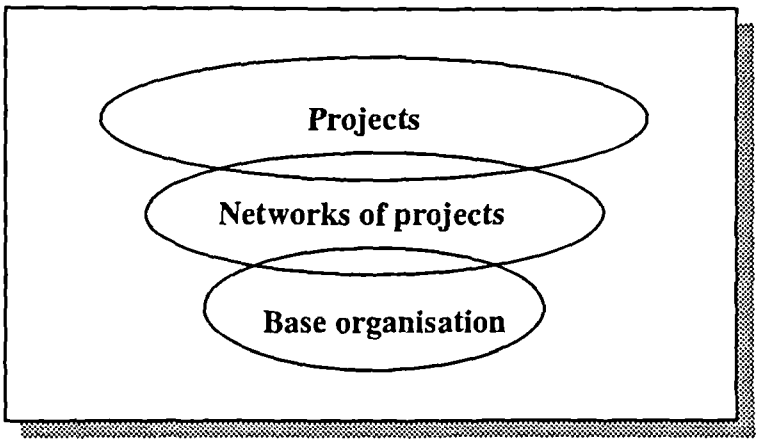


Figure 4.8 Structures of the project oriented company
Source: **Gareis**, *Management of networks of projects,* Project management without boundaries, Vol 1, 11th Internet World Congress, June 1992, p505.

It is suggested that the organisation should only invest in those projects that will guarantee larger strategic areas leading to the need for management of a portfolio of projects (Hauc and Semolic, 1992).

4.3.3 Portfolio project management

The objective of portfolio management is to optimise the results of the overall company and not to optimise the results of single projects (Gareis, 1992). The project objectives may be in conflict with each other or with the overall company objectives. Therefore priorities must be set between projects and the relationships between them must be managed. Portfolio project management must achieve the following (Gareis, 1992; Roetheli and Pesenti, 1986; Angling, 1988):

- Generate a holistic view of the network of projects,
- Recognise similarities and differences between the projects of the network,
- Recognise competitive or synergistic relationships between the projects,
- Judge the short term and long term situation of a group of projects in terms of timing and resourcing.

It is also possible, through portfolio project management, to learn and exchange experiences across projects. This enables the organisation to develop and learn as a whole thus fulfilling the requirement for organisational learning.

Coordination of the projects network can be achieved by a number of techniques including: redefining project objectives due to conflicts of interest, changing project priorities, changing personnel assignments, levelling risks between projects, transferring knowledge between projects (Gareis, 1992;1989). The portfolio of projects should be assessed to find the optimum allocation of funds across the projects to maximise the added value to the business.

Table 4.2 identifies the differences between management of individual projects and the management of a portfolio of projects. Clearly the skills involved in strategically managing a portfolio of projects are different to those required by a project manager managing the tactical implementation of a single project(s). This leads to a possible need for direct owner senior management involvement in projects.

FACTORS	PORTFOLIO OF PROJECTS	SINGLE PROJECT
ORGANISATIONAL LEVEL	Vice presidents Divisional general managers	Project Manager
KEY GOALS	Overall performance of the projects' portfolio	Time, cost, quality
STAFFING	Selection of project managers by top level managers	Selection of the project team by the project manager
PLANNING TASKS	Global formulation of project goals and objectives Overall planning and control	Detailed formulation of project goals and objectives Continuous planning and control of the project
TIME ORIENTATION	Long term: Permanent management of constant flow of temporary activities	Short term: Management of temporary activities
RESOURCE ALLOCATION	Allocation of limited resources within a portfolio to maximise its long term return	Efficient and effective allocation of resources to the project
CONFLICT RESOLUTION	Resolution of conflicts between projects	Resolution of conflicts within a project

Table 4.2 Determining factors in project management: The management of a projects' portfolio Vs the management of a single project. Source: **Navarre and Schaan,** *Design of project management systems from top managements perspective*, Project Management Journal, Vol XXI, No.2, June 1990.

4.4 Owner strategic management of projects

In conclusion it would appear that the owner has a responsibility in the early stages of a project to ensure strategic fit and completion of a project fulfilling the definition of value within the organisational framework. It is clear that a number of stages can be identified during this period for strategically planning a portfolio of projects. Some of the more important tasks of the owner during the strategic stage of projects are (Bell, 1991; Cleland, 1986; Horwitch and Pralahad, 1981; Stevens, 1992; Morris, 1989; Morris,1991; Gareis, 1992):

- Developing and implementing adequate strategic plans for the enterprise and project plans to support the projects technical performance objectives, schedules, costs and execution strategies.

- Developing a favourable corporate strategic environment.
- Developing an organisation design which delegates appropriate authority, responsibility and accountability.
- Facilitating the organisation's culture that fosters, recognises and rewards prudent project management.
- Surveillance and ongoing communication with project "stakeholders".
- Setting the tone for owner leadership of the project.
- Selecting project priorities, considering the interrelationships between projects.
- Structuring the project financing system to assess project portfolios.
- Establishing project oriented exchange of experiences.
- Managing planning process for approval.
- Establishing communication channels within and outwith the project organisation to ensure full participation in decisions.

It is suggested therefore that the tasks for the owner during the strategic stages of a project require particular skills and the organisation needs to encourage managers to open their view of projects and develop into visionary thinkers. By developing a visionary approach over a portfolio of projects, making high level decisions within the deepest culture of the owner organisation, strategic project management is facilitated. Priorities must be made across projects and an objective value assessment made, it is unlikely, however, that a project manager will be able to make objective assessments of his own or others' projects.

It is often the case that the *start* of the project is intangible and it bubbles within an organisation for some time before it becomes labelled a project. It is only at this point that the project manager is consulted, a point at which many of the strategic questions have already been answered (Morris and Hough, 1986). Cleland suggests there are a number of organisational levels with a role to play within a project. These are presented in table 4.3. The hierarchy presented overleaf suggests that the role of strategic planning should be conducted by others than the Project Manager, by a Senior Manager who functions in the capacity of "Manager of Projects". The danger with this is that it introduces another interface into the project process and alienates the Project Manager from the early project decisions.

The board of Directors for the exercise of trusteeship in the husbanding of corporate assets used in capital projects.
The CEO and Staff functioning as a "plural executive" for strategic and operating responsibility for the corporate entity through the optimum use of resources the achieve the corporate mission, objectives and goals and to finish capital projects on time and within budget.
A Senior Executive who functions in the capacity of a "Manager of Projects" to direct individual project managers' activities as well as proposing, planning and facilitating the implementation of project management plans, policies, procedures, techniques and methodologies as well as evaluating and controlling project progress.
The Project Manager who has residual responsibility and accountability for project results on time and within budget.
Functional Managers who provide specialised resources to support project needs.
Work Package Managers who are responsible for project work package budgets, schedules and technical performance objectives.
Project professionals reporting to the functional and project manager.

Table 4.3 Project organisational levels,
Source: **Cleland**, *Project Owners: Beware*, Project Management Journal, December 1986

Navarre and Schaan (1990) echo the view held by Cleland, recommending top management deal with the macro issues of a portfolio of projects leaving the project manager to manage the time, cost, quality equation of individual projects. The level of involvement will depend on the project characteristics: it's size, complexity, impact, strategic importance.

The project owner therefore has a number of issues to consider when implementing change through a project program. The responsibility lies with the owner to ensure that the projects are managed strategically to reflect the needs of the organisation. Strategic planning of a single project and strategic management of a portfolio of projects require very different skills. The latter task may present the project manager with problems he / she is not skilled to address. The link between senior management and the project manager must be a concrete one to ensure the strategic message filters into the project objectives.

4.5 Summary

It is an organisation's relationship with the external environment that leads to the corporate strategy as the business organisation tries to position itself in a competitively advantageous position. By comparing the external environment with the internal resources and adapting to suit the strategic direction, the organisation may develop. The development process is achieved by implementing change, either developmental, transitional or transformational change. The change program can be managed to overcome resistance, a feature which is inherent within the change process. An organisation generally conducts a project program to take it from position A to the desired position B with a set number of objectives.

This chapter has introduced the concept that the corporate strategy can be facilitated by the completion of a program of projects within an organisation. A clear link has been shown between the strategic objectives and the project objectives by basing early project evaluation on the strategic criteria. The organisation must consider the portfolio of projects under its control and manage them holistically adding benefit to the organisation rather than single projects.

Clearly the nature of the project and the industry within which it occurs will influence the strategic issues under consideration. This thesis is concerned with the management of construction projects, which exist within a complex, fragmented industry. The construction project is usually physical and visible, in many cases creating space for organisational operations, therefore an indirect but very important part of the business. Chapter five will discuss the contribution of construction projects to organisational development, discussing the complexities of the construction value chain and the management of value through the project lifecycle in order to fulfil the corporate objectives.

Part Three

The successful management of individual projects

Part Three suggests how the value adding activities of individual projects may be enhanced to add value to the business across the portfolio of projects. The project value chain is introduced, highlighting the factors that add value across the process.

Part Three draws upon an international comparison between the UK, North America and Japan.

Part Three is made up of two chapters:

Chapter Five: Management of project value through individual projects (An international comparison)
Chapter Six: Successful management of the project process

5 INTRODUCTION

Chapter 4 highlighted the need for portfolio project management in order to enhance business value, based on the interrelationship between corporate value, business value and project value. The discussion concluded with a description of the tasks required in order to strategically manage a program of projects to holistically add value.

This chapter will develop this theme by considering the achievement of project value through the management of individual projects. It will be argued that only by achieving individual project value will the portfolio of projects achieve business value. This inherent link adds to the argument for the strategic management of projects on an individual basis.

The key concepts discussed in this chapter are the project value chain, the project lifecycle, efficient boundaries within the project value system. The discussion will focus on projects of a construction nature due to the characteristics of the sponsoring organisation and the brief requirements. The chapter examines the contribution of procurement management, risk management and value management in reducing the barriers to value creation in construction projects.

This chapter will therefore focus on the project value section of the value triangle as depicted in figure 5.1.

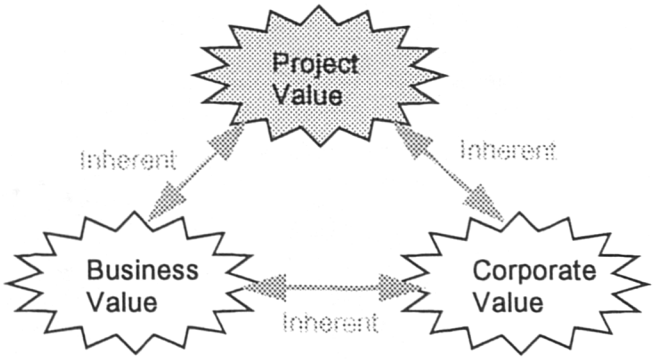


Figure 5.1 The holistic concept of corporate value
Source: **Tony Grundy**, *Strategic Value Management,* Management Accounting, September 1990, p40.

5.1 The characteristics of a project

A project is any series of activities and tasks for which a certain outcome is expected, within a certain expenditure of resources to be completed within a certain amount of time (Kraus and Cressman, 1992). In simple terms the project can be described as a transformation process, *superimposed on the regular or cycled activities of an organisation* (Beale, 1991: p24). This can be represented in the form of a model showing the project's evolution from a spark for changes in the environment of the organisation (figure 5.2). In this regard a project becomes part of a wider venture (Beale, 1991); the first part of which is the production of a product or service followed by an operating cycle. The project therefore takes place within a complex corporate, legal, financial and regulatory environment (Fox, 1984). This environment leads to a number of parties having a stake in the project from internal departments to external regulatory bodies and customers, since the project decisions have a potential impact on all stakeholders (Cleland, 1986).

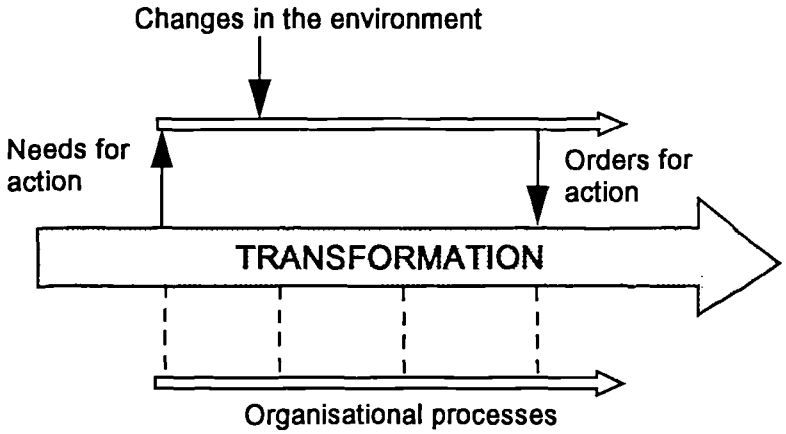


Figure 5.2 The project process
Source: **Holt**, 1977

The specific nature of a project will depend on the defined scope, ie the detailed description of the objectives for that project (Kraus and Cressman, 1992). Scope is defined in order to understand the client requirement, develop a project strategy and to enable continuous monitoring. Woolschlager (1986) identifies a gradual reduction

of uncertainty as project scope is defined in more and more detail. This seems to imply a project process by which the objectives are defined in more detail culminating in the accomplishment of these objectives ie that the project process requires specific management.

As the project environment alters with time the nature of projects becomes more complex. Changes over the past 20 years have resulted in projects competitively driven, requiring fast solutions to beat the market. Customer interfaces are becoming more complicated, compounded by unstructured project scope (Harris, 1992). The new flexible, matrix structure of client organisations has lead to cross enterprise projects with a multitude of sub objectives to fulfil (Fombrun, 1986; Hellriegel et al, 1989; Hunt, 1986; Morgan, 1986; Torrington et al, 1989). The client is becoming more discerning regarding the standard of service and product (Moore, 1991). The management of projects has therefore been under scrutiny for some time in an attempt to improve the quality of decision making, control and management in order to fulfil the client's expectations.

A project can therefore be characterised by the following features (Pinto and Slevin, 1989; Cleland, 1986; Beale, 1991):

- A defined beginning and end
- A specific preordained goal(s)
- A series of complex or interrelated activities
- A limited budget
- A network of internal and external interested parties with a stake in the project
- The use of a number of different resources and disciplines
- An element of uniqueness.

The next section will analyse the interrelationships between these factors within a project life cycle, coming together to add value as the project progresses.

5.2 The project value system

The project has been highlighted as a series of activities taking place within an organisation in response to a need. It therefore inherently forms part of the organisation's value chain spanning all of the value adding activities of the organisation. This is schematically represented in figure 5.3, leading to the concept that the project adds value to the organisation through it's own processes. The project value chain forms part of a wider value system encompassing the value chains of the suppliers, customers etc. (Porter, 1985; Matthews, 1992). It is the linkages between the various members of the value system that prescribes the route of the resources through the project lifecycle and thus the value added to them as they come together to form the final product (Matthews, 1992).

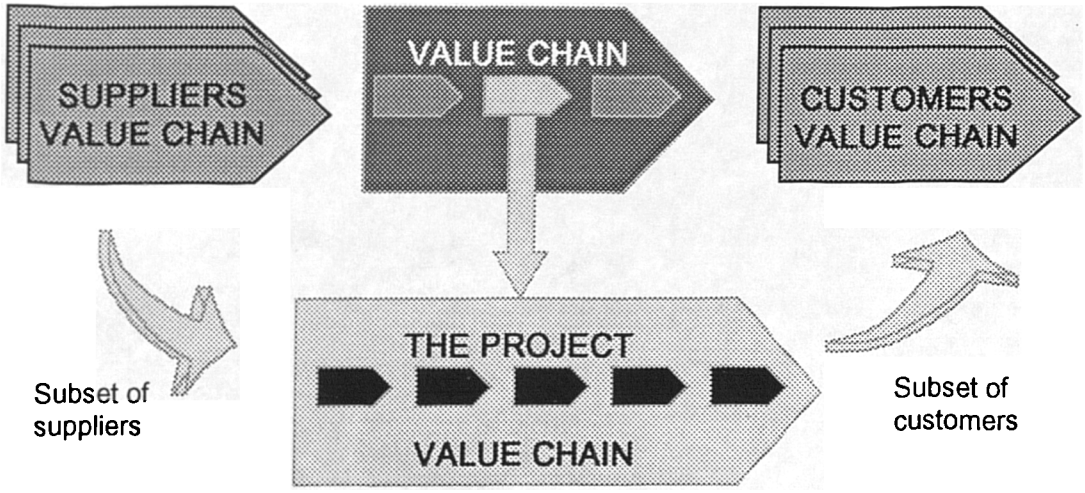


Figure 5.3 The individual project value chain as part of the organisation's value chain, Source: Author 1994

An alternative explanation of this process is the supply chain, *a sequence of events which adds value to material or information* (Brace, 1993). This supply chain is then the physical means of satisfying a market, the means whereby a customer finds goods useful because he is presented with what he needs, where he needs it. The analysis of a supply chain may start at any point in the project process; the perspective of the

project is altered by choosing an alternative starting point in the supply chain. It is often the assumption that component parts already exist that leads to non optimum value. This is due to positioning the boundaries between actions and participants without analysing the most valuable allocation of tasks.

The most common relationship in the supply chain is that the firm nearest to the final product places business "backwards" in the chain, by ordering components from the suppliers and then adding value to these components. However, reference to the analysis of *efficient boundaries* may call for adjustment of these commercial relationships (Reve, 1990). If each individual element in the project value chain is run independently by a manager with local short term objectives to optimise the apparent contribution of that element, internal discontinuities may occur. Optimisation of the individual parts of a system do not necessarily optimise the total system (Brace, 1993). An holistic view of the project, on the other hand, will allow the production of value across the value system, optimising the individual contributions in the context of the whole project.

Differentiation between the individual elements in a project value chain leads to "*spatial differentiation*" points at the interfaces (Morris, 1972). Discontinuity between these interfaces should promote coordination and management methods to increase integration and reduce discontinuity between the project phases. Fragmentation of interfaces increases with project complexity due to the increased number of subsystems. The necessity for coordination and control therefore increases as the project size, speed or complexity increases. *"...the extent and quality of information transferred between project subsystems and the timeliness of decision making at the interfaces will be influential upon performance and consequently upon participant satisfaction"* (Langford, Newcombe and Fellows, 1986: p949)

Cooperative planning, and rapid and complete information exchange across these interfaces are unlikely to happen in a culture where the relationship between trading companies is adversarial and links are divergent. It is often the case that short term

links are established by bargaining with buyers and suppliers concentrating on short term price advantage. Added value is realised at the end of the value chain at the consumer of the product; this is therefore where the focus for value linkages should lay.

In seeking to control the value activities it is necessary to resolve the impediments to value production in the system. Chapter two highlighted the core business of the sponsoring organisation as consisting of four elements. These have been presented in figure 5.4. It is interesting that the management of major projects is one of the four constituents alongside the more traditional core elements. In this regard, BAA plc places much worth upon the major projects it undertakes and considers the development of the business to be concerned with their success. The project management process can clearly add value to the business if managed within the context of the business. This thesis is concerned specifically with the major projects element of the core BAA business, investigating the nature of the construction industry and the production of facilities for a building client. The discussion will therefore focus on the nature of the construction industry and the impediments to value that exist there in. The next section will review the complexities of the construction industry that lead to the requirement for specific value controlling activities.

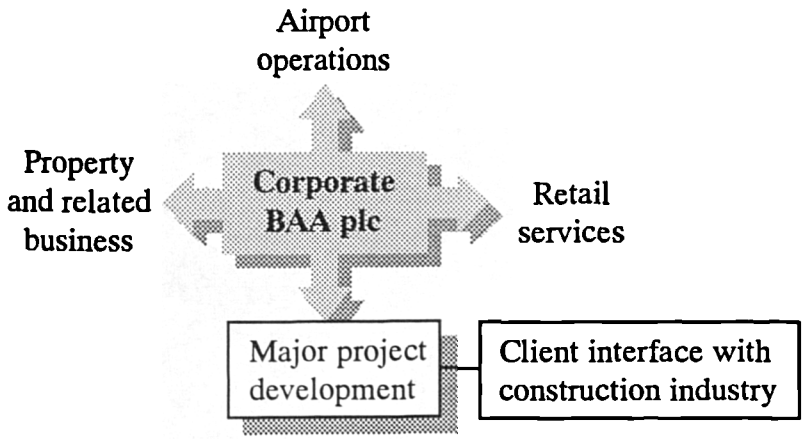


Figure 5.4 Major projects development as an element of the core business of the sponsoring organisation, Source: Author, 1994

5.3 Impediments to value during the construction process

This thesis is concerned specifically with the management of a construction project, which can be defined as *the sum of planned activities, material or otherwise, of an organisation to convert an idea or a design for engineering or construction work to fulfil human or economic needs within limits of quality, cost and duration* (Santana, 1990). Also how construction projects add value to the corporate process. The building project lifecycle has been broken down into a number of stages from idea generation through design into design realisation and completion. The standard model used in the building industry is the RIBA plan of work (figure 5.5), although this is considered to misrepresent the process by it's degree of sequentiality by Morris (1972). He builds on the RIBA model and others to form his own model of the building process, emphasising that there is no fixed order of interrelation between the stages (figure 5.6).

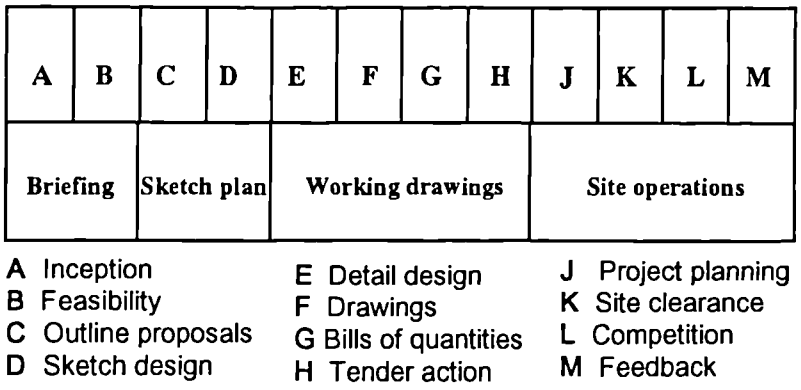


Figure 5.5 RIBA plan of work, Source: RIBA

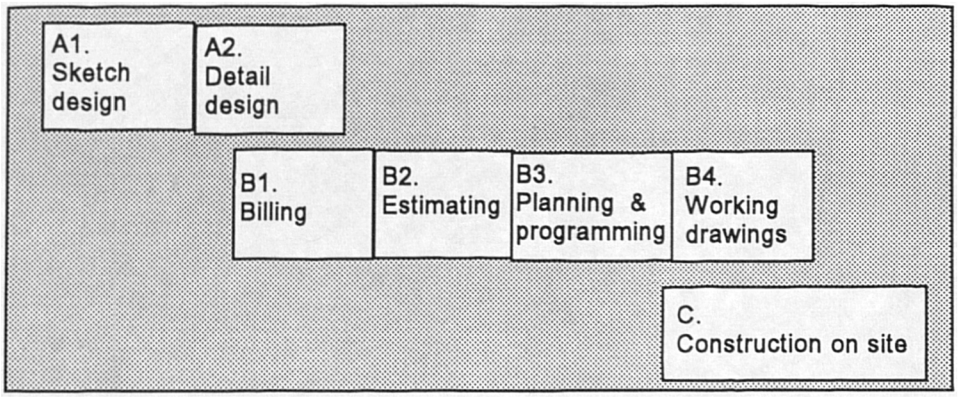


Figure 5.6 A model of the building process showing the seven major task subsystems in the process, Source: **Morris,** *A study of selected building projects in the context of theories of organisation*, PhD UMIST, Oct 1972

The construction industry is often accused of performing poorly and producing products of poor value to the customer, implying that there are factors within the system that act to hinder the accumulation of value. The impediments to achieving value during a building project are concerned with a number of characteristics which can be grouped under three main considerations, these will be reviewed below:

- The nature of buildings
- The nature of the construction industry
- The nature of the client organisation.

5.3.1 The nature of buildings

The complexities of the building process are dependent to a degree on the fact that buildings are complex in themselves. This impacts the building process in that they serve many purposes, take a long time to develop, involve a large number of people and consider many variables (O'Reilly, 1987). Technologically, the building / construction project is not particularly complex but there are exceptional projects of extreme technological complexity; however many other factors also contribute to the definition of a complex project (Jaafari and Schuls, 1990; Santana, 1990).

In addition to this a building, or indeed the result of any construction process, is highly visible and therefore has a high degree of environmental impact.

All these combine to form a very complex equation for the project manager to solve. The interrelationship between functions within the building often impact on the efficiency of the building whilst in use (Kelly, 1991). Therefore the building has holistic properties which may not be recognised by the individual functions within. Therefore any attempt to define the objectives of a facility may prove difficult as it will inherently involve many parties and interrelationships.

5.3.2 The nature of the construction industry

The second element acting to impede value creation is the industry structure itself. The construction process relies on pulling together a number of diverse organisations into a hybrid organisation for the duration of the project. The nature of the industry leads to a situation where the actors in the project process provide inputs at varying degrees over the duration of the project, arriving and departing as their input is required (Cherns and Bryant, 1984).

The fragmentation seen in the construction industry arises from it's historical development, when there was a strict hierarchy of professionals and contractors leading to unnecessary barriers to information and sources of conflict (Higgin, Jessop and Fellows, 1965; Turner, 1990). Not only are the professions fragmented into the architect, engineers, designers, quantity surveyors etc. but also the constructors now consist of specialist suppliers and subcontractors. The results of this characteristic are that the building process is split progressively amongst parties to the project; risk inherent in the project process, is not managed but shifted amongst the parties by formal contractual agreements; information does not necessarily flow to optimise the project process. The long term objectives of the contractors and professionals are often in conflict with the long term objective of the client (Emmons, 1987). This leads to a situation where actions are taken towards individual goals, sometimes at the expense of the project goals.

Due to this separation of task responsibility, the project process has developed with the design and construction phases separated leading to a complex interface at the start of the construction phase. This often results in missing information and redesign at a cost to the client. The differentiation of the industry does not allow experiential learning from this process as it is rare for organisations to work together continuously on projects. New relationships are made and broken on most projects, leading to a learning curve on each project.

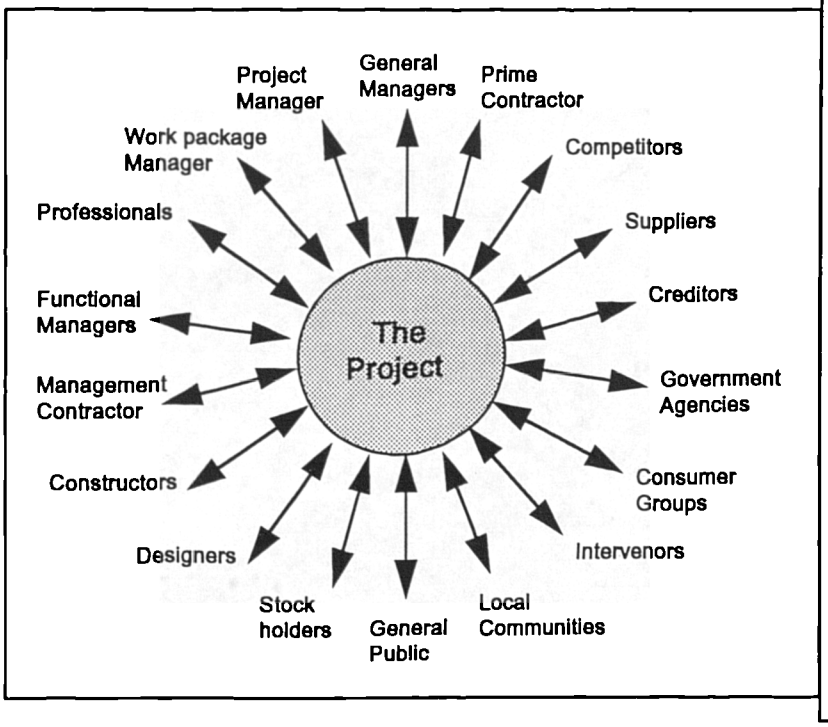
The problem arises with the requirement for "*continuous intercommunication between interdependent activities independently carried out*" (Higgin and Fellows, 1965: p20). Higgin et al attribute the main factor lying behind the communications difficulties to the nature of the relationships between the communicators. Until the culture of the industry has shifted then it will be difficult to alleviate these communications barriers.

The project has been seen as an engagement of several organisations over different points in time (Cherns and Bryant, 1984). The way in which the client arranges these inputs in purchasing the construction project is via the choice of the procurement route. This aims to optimise the relationship between each party to the project and allocate risk and responsibility in the most suitable fashion. It is also a mechanism for the client to ensure he is receiving his project at the appropriate cost. The traditional method of procurement whereby the architect coordinated the project design process and the construction process, has become divergent with the objectives of the client and new non traditional methods have arisen (Moore, 1984; Turner, 1990). During the construction process itself conflict arises due to the need for shared and linked resources, interdependent assignments, ambiguous reporting relationships and dynamic, stressful lifecycles (Keszbom, 1992).

5.3.3 The nature of the client organisation

The third feature standing in the way of value enhancement during a building / construction project is the client organisation itself, usually consisting of a complex network of interested parties. Confusion can arise by simply discussing the client during a project as it means different things to different parties to the project. The client may be the owner, the buyer, the end user or indeed the project manager. Bresnen et al (1990) define the client as *the organisation responsible for the production and development of the building.* The customer itself is a complex entity and the value defined by the client will vary across the hierarchy of the client organisation. Therefore different interpretations of value will be generated dependent upon the position within the value chain.

In this context the client will be considered as the sponsoring organisation, who will in turn have a network of stakeholders with whom communication, coordination and management is required. The project stakeholders are defined as those who have an interest in the outcome of the project or who are able to affect the outcome by provision or withholding of information or support (Briner and Geddes, 1988). Figure 5.7 presents the project stakeholders as interpreted by Cleland (1986), as an example the list of stakeholders for an airport construction / building project accompanies the diagram. It is important therefore to recognise the divergence of the term *client* to those within the project process. Clients may exist within a particularly political environment leading to additional stakeholder issues during the project (Davidson and Huot, 1989).



List of possible Airport Stakeholders:

. End user
. Airport Community
. Airport Neighbourhood
. Dept of Transport
. Health and safety executive
. Dept of Environment
. MMC
. Airlines
. Passengers
. Terminal Management
. General Management
. Customs
. Immigration
. Police
. Concessionaires
. Contractors
. Suppliers
. Designers
. Consultants
. CAA
. Creditors
. Competing Airports
. Press

Source: Author, 1994

Figure 5.7 Project Stakeholder Network
Source: **Cleland**, *Project stakeholder management*, Project Management Journal, September 1986, pg 40

The nature of the technology required and the procurement choice will be dependent upon the client and the objectives therein (Moore, 1984; Singh, 1991). The client organisation will be subject to its own set of values and expectations requiring different services from the construction project. The reasons for early decisions originate in the clients culture, procedures and structures, shaped by social, political, technical and economical factors, and clients pre project history. Many problems during the project occur due to unresolved conflicts within the client organisation (Cherns and Bryant, 1984).

The client is the source of funds for the construction project and will therefore set the tone for the project cost dynamics and resource availability. The source of these funds will be dependent upon the nature of the client in that it may come from the core business of the organisation, it may be borrowed or indeed may be from public authority grant. The nature of the clients business will also impact the location of the project and conditions in which the project must be completed.

The client will be primarily involved in his core business, the project will simply be a means to sustain and develop this business. It is fair to say that the client will not place his emphasis on projects and the uncertainty surrounding a project often results from a lack of resources from the client organisation. It may also be the case that the client is unclear of his own requirements and therefore provides an inadequate brief to the contractor. This may also lead to changes to the design as the project progresses causing significant problems for all parties to the process as well as adding cost to the project. Each of these will depend upon the experience of the client in conducting construction projects.

In conclusion of the above points, the creation of value within the client's project system will be dependent upon:

- The client's business
- The client's experience in building / construction projects
- The client's organisation structure
- The client's access to resources.

In summary therefore the impediments to value in the construction process are rooted in the nature of buildings themselves, the fragmentation and adversarial nature of the construction industry and the nature and experience of the client organisation.

5.4 Overcoming impediments to value through project management

Clearly the building project is subject to a series of complexities and difficulties combining to impede the creation of value across the project value chain. In order to break down the barriers to value creation it is necessary to manage activities of both the process and the product. The optimisation of value can thus be considered to rest in two areas: the management of process value and the management of product value. The next section will review the techniques that can be utilised in the management of the process and product, reviewing the literature on North American and Japanese construction project management to search for the best practice in each area.

5.4.1 *Adding value through process management*

Morris (1972) explains the development of a project in terms of three dimensions: process, technique and organisation, as illustrated in figure 5.8. These are shown to be time dependent implying a sequence of events during the project process. These events are held within the project lifecycle, separating the project into a series of stages from a concept or idea through the development of the design and production through to completion. The way in which these stages are integrated is dictated by the choice of procurement route. The procurement process involves designing a temporary organisation made up of a multitude of organisations, mandated to design and construct a required facility. It involves three primary stages:

- The client determines the most appropriate way of organising the project process to fit the particular needs, risks and constraints.
- The project team assemble to implement the selected process.
- The project develops through the stages of design and construction until it is completed, delivered and ready for occupation.

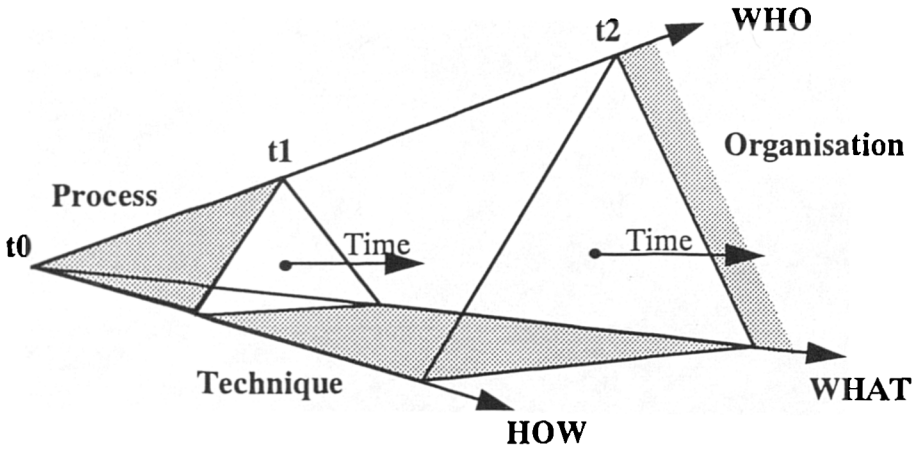


Figure 5.8 The dimensions of project development
Source: **Morris**, *A study of selected building projects in the context of theories of organisation*, PhD UMIST, Oct 1972, pg10

There is no single procurement route that may be defined as optimum in all cases. The changing environment and enhanced client requirements have lead to the evolution of non traditional forms of project delivery ranging from minimum client involvement to full involvement of the client in the design and construction process (Chappell, 1991; Moore, 1990; Singh, 1991; Sydney, 1992; Turner, 1990). Historically the choice of procurement route has been dependent upon the client characteristics, not on the project objectives (Bresnen et al, 1990). By allocating tasks across the project participants the balance of risk is shifted (see figure 5.9, Turner, 1990; Bishop, 1991), basically the consequences of a higher level of client involvement is an increase in risk to the client (Carter, 1991).

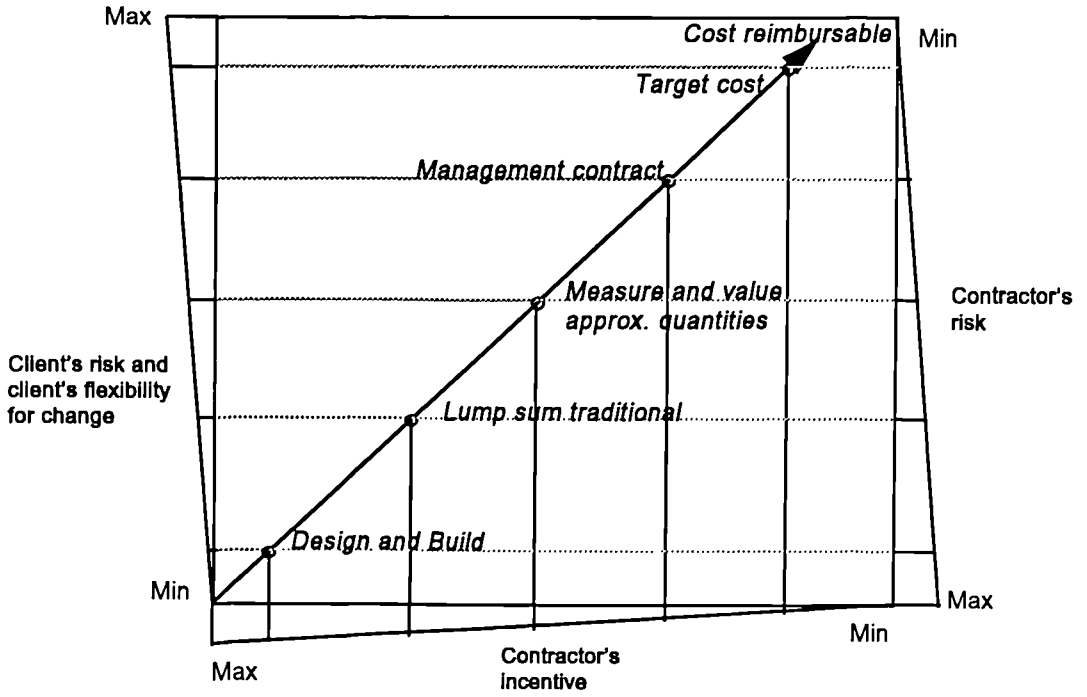


Figure 5.9 Procurement risks and characteristics of types of contracts
Source:**Turner**, *Building procurement,* Macmillan Education Ltd, 1990, p93.

Traditionally a contractual framework, which will bind all parties to the project, is structured so as to define clearly each party's scope, duties, responsibilities, liabilities etc. (Shiplee, 1991). The contract should also enable clarification of the risks and their allocation and ensure timely transfer of information (Ward, 1991). The procurement route therefore dictates:

- Clarity of task definition
- Ease of access to information and
- The interdependence of activities

Furthermore the procurement route has been found to be directly related to the performance of the parties to the project (Davidson and Mohsini, 1987; 1990).

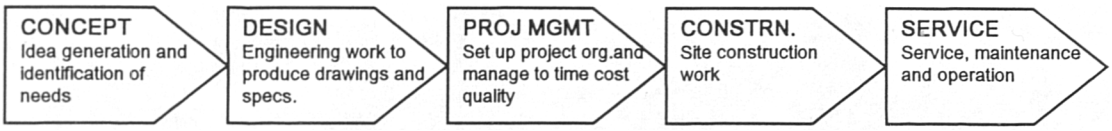
The choice of project delivery route must be based on the priorities of the client's objectives. The work of Singh (1991) is used to illustrate the range of procurement options and the objectives by which they may be chosen (figure 5.10).

Each procurement route will provide differing benefits to the project, the choice of project delivery must be based upon the project objectives and the method that will deliver maximum value.

Figure 5.10 Procurement Decision Matrix

Clients Priority Questions	Clients rating	% priority rating	A. Negotiated Lump Sum		B. Competitive Lump Sum		C. Negotiated Design & Build		D. Competitive Design & Build		E. Negotiated Turnkey		F. Construction Management		G. Unit Rate		H. Cost plus Fee	
			Utility Factor	Result	Utility Factor	Result	Utility Factor	Result	Utility Factor	Result	Utility Factor	Result	Utility Factor	Result	Utility Factor	Result	Utility Factor	Result
SPEED How important is early completion to the success of your project?			67.9		47.7		95		73.3		86.1		76.1		62.6		73.7	
CERTAINTY Do you require a firm price and/or strict completion date?			92.3		90.9		81.6		81.9		79.5		65.9		37.9		39.1	
FLEXIBILITY To what degree do you see the need to alter the project once begun?			58.9		44.6		70.9		58.2		58.1		84.5		87		96.6	
QUALITY LEVEL What level of quality, aesthetics (+) you require in design /workmanship?			75.8		70.9		68.4		63.2		65.5		81.6		65		85.6	
COMPLEXITY Is your building highly specialised, technologically advanced or highly serviced?			93.7		91.3		83.5		81.8		73.5		63.2		51.5		51.7	
RISK/RESPONSIBILITY To what extent do you wish one single organisation to be responsible for the project? or risk of cost/time slippage?			76		79.1		79.1		82.6		75.6		63.3		33.9		39.6	
PRICE COMPETITION Is it important to choose your construction team by price competition?			76.7		99.3		67.6		84.7									
DISPUTES To what extent do you want to avoid disputes and arbitration?			94.2		84.8		81.8		73.6		72.8		65.9		56.1		58.8	
TOTALS																		
RANK ORDER																		

The chosen method to manage the delivery of a project must allocate tasks across the multi organisation in order to optimise the value delivered at the end of the project. This has been illustrated in figure 5.11, where the client's responsibility is shown shaded, in three alternative approaches to the project, defining the efficient boundary around the client in each case. These alternatives challenge the traditional concepts behind allocation of risk and responsibilities across the project. The current perception calls for strategic, structured processes to reduce the barriers to value and integrate the project participants through communication, trust and common goals.



The project value system as a progression of project stages

a) Efficient boundary for a project with standard build or production

b) Efficient boundary for a complex project where client does not internalise but develops competitive efficiencies through integrating all stages

c) Efficient boundary for a complex project where the management stage is decoupled and contracted out.

Figure 5.11 The relationship boundaries established under different procurement options, Source: **Reve,** ***The firm as a nexus of internal and external contracts*** in Aoki, Gustafsson, Williamson: ***The firm as a nexus of Treaties, Sage, 1990***

New developments in this area include:

- **Partnering** (*Cowan, Gray and Larkson, 1992; Emmons, 1987; Moore, Mosley and Slagle, 1992; Sanders and Moore, 1992*),
- **Constructibility** (*Tatum, 1987; Griffiths, 1989; Vardham and Yates, 1992*),
- **Contractor prequalification** (*Jaselskis and Russell, 1991*),
- **Risk management** (*Del Cano, 1992; Chapman and Cooper, 1985; 1987; Chapman, 1991; McKim, 1992; Orr,1991; Perry and Hayes, 1986;* Ward, 1993),
- **Site logistics** (*Macklin and Picard, 1992; Brace, 1993*).

The philosophy behind these techniques is one to ensure that the project organisation enjoys full communication, trust and sharing of risk and responsibility. To illustrate this point the developments noted above will be briefly described:

Project Partnering

Partnering facilitates the *design of an effective problem finding / problem solving management team composed of personnel from both parties (contractor and client), thus creating a single culture with one set of goals and objectives for the project* (Moore, Mosley and Slagle, 1992, p18). The improved communication, shared risk and collaborative problem solving combine to add value to the process. This collaborative relationship leaves behind the anathema of adversarial, arms length relationships often leading to litigation and exploitation (Cowan et al, 1992).

The partnering process requires time and money up front as well as leadership and commitment from both parties to the partnering. The Japanese construction industry builds long term relationships amongst contractors, developing a "family" of contractors with whom regular work is conducted (Gow, 1988; Hasegawa, 1988; Bennett, 1993; Flanagan, 1991). In turn the contractors have a family of subcontractors. In this way experience and personal relationships are developed, fulfilling their cultural commitment to mutual trust and interface management. The Japanese culture allows the creation of such bonds, the UK industry is finding the "philosophy" of partnering difficult as risk exposure is increased.

The US Army corps of Engineers were the first to use partnering techniques in the public sector. It was concluded that the open lines of communication led to improved levels of job coordination, dispute resolution and quality control across the whole value chain (Sanders and Moore, 1992). In order to achieve these benefits 100% commitment was required, 100% of the time.

Constructibility

As the project team come together grey areas develop as their duties overlap. It is the way in which these individual parts are integrated that adds value to the process (Briner and Geddes, 1988). Interface management should facilitate the planning, scheduling and controlling of the project interfaces in close cooperation with the functional managers (Archibald, 1988). Decisions made at an earlier stage in a project act as an input to the next stage and new information is added at each stage that may change the earlier decisions. It is therefore important to bring into the design at early stages the insight and input from most disciplines involved so as not to overlook any aspect (Rosenfeld, 1990).

The interface between the design and construction phases of a project is considered the most divergent due to the make up of the industry (Morris, 1972). Griffiths (1990) contends that architects formulate their ideas around design elements rather than consider the operations required for actual construction. The philosophy of constructibility encourages a focus on the totality of the design and construction process by (Tatum, 1987):

- Early involvement of construction professionals
- Pre construction planning - avoid incompatible tasks, shared equipment on site, movements on site (see section 5.4.1.5) (HMSO, 1991)
- Educating designers to be receptive to constructibility techniques
- Encouraging a commitment to "more value for money".

Bringing construction knowledge to the design process through alternative procurement allows optimisation of the design details and sequencing to meet the

construction needs. It ensures that the team think through the entire project before starting the design process, so avoiding construction problems and control construction cost (Vardham and Yates, 1992).

The Japanese have overcome the constructibility barrier by placing control of design in the hands of the constructor (Hasegawa, 1988; Bennett, 1993; Fisher, 1993). This is achieved by the large general contractors (*the big six*), who offer their client's the full range of services in an attempt to gain a competitive edge. The client devolves project responsibility to the contractor at an early date, relying on their long term relationship in the achievement of project goals. The contractor then ensures that the design is complete in every detail before construction and that the construction method is planned during design (Bennett, 1993).

It is also believed that in the US constructibility is more prevalent due to the use of trade contractors and specialist designers filling in the detailed design on the architects drawings (Lynton, 1993). In his comparative study of US and UK practice, Freeman (1991) sites that the US contractor is involved in the design, thus adding specialist construction expertise; also the US designers take greater account of availability of materials and the operational implications of their designs. This is a trend which has been slowly recognised in the UK although it has not yet been realised on many projects.

Contractor prequalification

The project value chain opens the project to a variety of organisations each with their own short term objectives influencing the achievement of the project objectives. It is vital that the client is comfortable with the participants to the project process and able to place his project in their hands with trust. It is therefore important to systematise the selection of the project personnel, seeking specific high performing personnel from past experience.

Performing a filtering process ensures that only those contractors / professional with the right attributes and meeting the aspirations of the client are actually considered for the project (Jaselskis and Russell, 1991). In making this selection it is more likely that the value criteria of the individual project team members will be consistent with the project value criteria, removing the chances of conflict.

The long term relationships nurtured within the Japanese culture (Levy, 1990; Flanagan, 1991; Bennett, 1993; Lu, 1987) result in the natural preselection of contractors due to the pre established learning curve. This allows the building client to transmit his interpretation of value to the project organisation over a period of time and over a number of projects.

In summary this section has discussed the new developments that have arisen to reduce the boundaries existing in the building process. These have included project partnering to create sustainable interfaces between the different parties to the project process; constructibility to interface the primary phases of the building process; contractor prequalification to facilitate the choice of suitable contractors who understand the clients business and therefore improve the value adding links. The following section will briefly discuss risk management and site logistics as developing techniques for achieving value across the project process.

Risk management

Risk management is a huge topic demanding more space than warranted in this thesis; however, this section will simply review the main aims and methods of risk management. Risk has been described as *the combination of individual uncertainties which have an impact on the overall objective of the project* (Williams, 1993: p5). The management of risk does not aim to remove all risk from the project, rather it aims to ensure that risks are managed most efficiently. To be effective the management of project risk must be commenced from the very beginning of the project lifecycle (Ward, 1992).

Risk management is a cyclical process with three distinct phases: identifying all significant sources of risk, analysing the probability of occurrence and developing a spectrum of feasible responses to the sources of risk (McKim, 1992; Perry and Hayes, 1986; Orr, 1991; Chapman and Cooper, 1985;1987; Chapman, 1991). The allocation of risk across the project participants according to those best capable of dealing with the risk is the objective of the whole process. The degree to which formal quantitative methods are employed depends upon the complexity of the project and the way in which the data will be used (Cooper and Chapman, 1987). It is often argued that full risk analysis is inefficient and unnecessary (Chapman, 1991). One of the primary benefits of the risk management process is the identification and communication of risk, regardless of the probability of it's occurrence. Qualitative risk management may be used to evaluate possible options to establish clear identification of the project strategy at an early stage.

The benefits of utilising risk management procedures are:

- Technical, environmental and political influences are related directly to the project
- Members of the project team are made aware of the likely problems in their area and that of others, thus developing teamwork
- Analysis continues until the team are confident that they can cope with all foreseeable events
- Knowledge and judgements are formalised and documented, improving learning for similar projects at a later date.

Clearly the use of risk management reduces the uncertainty within the project and therefore enhances the probability of completing within the clients criteria. In reviewing the literature it becomes clear that the Japanese construction culture of mutual trust leads to a situation where risk is shared between the client and the contractor without redress to contracts. The system does not however promote the identification of risk since it does not form part of the early contractual

considerations. The US system clearly allocates risk and responsibility contractually in the early stages of the project (Freeman, 1991).

Site productivity and logistics

The productivity achievements of the US compared with those in the UK are often sited as one reason for the lower construction costs in the US (Lynton, 1993; Freeman, 1991). The site processes form the final link in a long chain of value adding activities and failure to achieve productive construction will result in a less than optimal value added at the end of the project.

Increasing productivity on site is as much to do with preplanning and design as labour motivation and work practices. Labour utilisation comprises three factors: direct productive activity, indirect activity (walking, waiting, seeking information etc.) and downtime (delays and standing idle) (Macklin and Picard, 1992). Efforts to improve the productivity of UK construction sites have been somewhat fruitful but still lack the efficiency of the US (Lynton, 1993). It is not simply a case of attacking the procedures once on site, since the site workforce is at the end of a long chain of earlier events and decisions.

We have identified that the process of achieving value is in fact a continuum, from the time resources enter at the front of the process to the time the final product is delivered. Planning in the early stages of a project adds value to the processes to be conducted on site if it can reduce the indirect activity. Lessons may be learned from the manufacturing industry who have shifted dramatically by use of Japanese techniques such as Just In Time delivery, Kanban, Clean storage areas, integrative factory flow system etc. (Brace, 1993; Fisher, 1993). Simple site layout affects the walking distance and resource allocation, impacting greatly on the efficiency and thus added value to the construction process. Active involvement of research and development in Japan has lead to developments in construction site automation, removing the laborious and precision jobs from site workers (Hasegawa, 1988).

The productivity message pervades the whole project organisation in Japan through *Kaizen*, a method of improving work procedures by continuous improvement (Fisher, 1993; Levy, 1990). The site workers are encouraged to seek out problems and work with the research and development division to reach solutions. These are then implemented in an attempt to improve the efficiency and effectiveness of the construction process.

It is however interesting to note that the high productivity experienced on Japanese construction sites is limited to the sites of the large general contractors. The management skills are nurtured through ongoing training and development, whilst the small contractors exhibit very poor productivity levels, which are decreasing since the training is depleted and of low quality (Hasegawa, 1988).

Many of these processes can be assisted by the simple philosophy that the next person in line is the customer, a philosophy promoted by the work of Deming (1950) in Japan. Thus expansion of the definition of the customer results in any interfacing organisation being considered a customer who demands the same level of service as the external customer (HMSO, 1991). The Japanese manufacturing environment utilises this philosophy, never passing on a defect to a customer within the chain. This philosophy again breaks down barriers to value and raises awareness of the interdependence of tasks.

In summary, section 5.4.1 has addressed the ways in which the impediments to value, inherent in the construction industry, may be reduced by management of the project process. The fundamental route to breaking down the interface barriers is by careful choice of the procurement route. This along with a series of other techniques allows the client to develop relationships of mutual trust and common objectives driving the project toward the value expected by the customer. The next section will briefly review the techniques available to increase project value through *"product management"*.

5.4.2 *Adding value through product management*

In passing through the project value chain it is necessary to ensure that value is not only being added via the process but also that the product is receiving added value through design and appropriate controls. Models exist for the management of cost (Sundswick, 1990; Summers, 1990; Hatwell, 1993; Dreger, 1990); the overriding message is that the management should be conducted sequentially. The use of life cycle costing, whereby the hidden running costs of a project are considered within the project cost options, adds to the long term value of the project (Hatwell, 1993; Heath, Barham and Edwards, 1990).

But product value is more than cost, it is necessary to balance the time, cost and quality equation in managing product design within the context of the project (Dreger, 1990). Methods for managing the schedule of project development have been developing over many years and now form sophisticated PERT and Critical Path techniques. It has recently arisen, however, that scheduling is considered as more than a tool to create deadlines and meet prearranged dates, but that it forms part of the planning process for the project. Janzen (1992) recommends that scheduling should be an iterative process, providing raw information early on in determining the owner's needs. The early raw schedules therefore provide the basis for decision making, communication of the schedule and project control.

The newer techniques to become apparent in the UK emphasise the careful management of the product design both in terms of the design process and the materials and elements of the design. These include:

- design management,
- standardisation of design,
- quality control,
- value management and value engineering.

The following subsections will briefly review these techniques.

Design management

Good design requires good management (Constable, 1989). Unless the brief has been well established and fully understood by a designer of adequate competence, a successful product will not result (O'Reilly, 1990). The need for management arises from the fact that the design process calls for input from a number of specialist designers each with their own perspective of the design. The areas of their specialism overlap a possible cause of conflict and rolling delay. For this reason it is necessary to pull these designers together in a direction of mutual understanding reflecting the value criteria of the customer (Constable, 1989). The changing characteristics of projects has lead to the requirement for a design management model to monitor and control the design with minimum intrusion into the creative process (Miller, 1993).

Projects will need to accommodate the following:

- higher front end control
- greater explanation of design decisions
- innovation with more specialist short term involvement
- closer management control and more management information
- faster reaction to change.

The client organisation therefore needs to minimise the number of procedures; maintain single points of contact, effective direction and rapid approval; record clear, concise objectives; establish direct lines of communication and liaison teams; and develop an effective review system for change orders (Fazio, Moselhi et al, 1988; Miller, 1993). This is lived out in the Japanese large contractors where all construction professional are within the same organisation and very often within the same building (Hasegawa, 1988; Bennett, 1993; Flanagan, 1992). The barriers are removed to allow design management to flow with the product.

The US designer is given full control over his own budget and thus develops the design within pre set boundaries. Cost management is not considered a separate specialist skill, thus reducing the interface problems. The UK method of cost

management checks the work of the designer to confirm it lays within the cost limits. The literature does not fall on one side or the other of these philosophies. It is clear that there is a role for a cost manager within the project process, but it should be mush more than simply policing the work of the designers (Williams, 1983).

Standardisation of design

A much debated topic is the degree to which products should be standardised. It is common to enter an organisation and find many bespoke designs having arisen out of years of changes to a basic element. The costs associated with this have been questioned by many companies and standardisation has been pursued. Greater use of standardisation in the US both in terms of product and process has had a ripple effect on the construction process (Lynton, 1993):

- the client's cost expectations are different
- designers use simpler and more repetitive designs
- trade contractors have less to learn from project to project
- there are greater efficiencies achieved in manufacturing.

Standardisation does not necessarily reduce innovation, it adds flexibility and reduces costs through the whole supply chain thus adding value to the construction process (Brace, 1993).

Quality control

The control of quality has often been regarded as a luxury within the industry and as costs are squeezed, quality control (QC) is often one of the first to suffer. Lynton (1993) identify that the perception of quality in the US differs from that in the UK, one of the factors leading to a price differential. What then is quality? It is the adherence to the specification as detailed by the client in fulfilment of the customer's objectives. Quality is perceived to ultimately lead to a better product.

QC is a concept developed initially by an American statistician, W. Edwards Deming (1950). Whilst more or less ignored in the US his concepts were wholeheartedly embraced by Japanese industry in the 1970's (Levy, 1990). Deming felt that management was largely responsible for the quality of a corporation's product and that their influence on the worker would result in high quality levels on the production line. Total quality control means more than just checking the specification of materials in Japan; it is an all consuming corporate philosophy that has as it's goal the uplifting of every aspect of company life. Large construction companies in Japan also have this as their philosophy and rely on total quality circles to continuously improve their products and processes on site.

In fact the Japanese corporation takes the philosophy one step further than their own process, recognising the need to address the whole supply chain. Lu (1987) discusses the "honey bee concept", whereby the Japanese organisation goes into it's supplier companies to transmit the quality message. This concept is so named as it is compared to the way in which a honey bee moves from flower to flower transmitting pollen. So the Japanese corporation moves from supplier to supplier transmitting and managing quality.

The concept has been transferred back into the US manufacturing industry but has been fairly slow to catch on within the construction industry. When considering value enhancement across the project process, quality control must be considered both in terms of controlling the quality of management during the project but also controlling the physical quality of materials and construction activity. The North American efforts have been geared toward the concept of value management, an attempt to control quality within the context of cost.

Value management and value engineering

Within any product or service there are a number of features comprising it's total value. In order to define the characteristics of the required product it is necessary to highlight the individual functional elements of value and rank them in order of importance. In this way the worth of each function can be assessed and true value for money achieved. One method of achieving this is to use a technique called Value Engineering (VE). Since its emergence in the US manufacturing industry in 1947 (O'Brien, 1976), VE has developed into a systematic method to analyse the function of elements in a design. It was not until 1972 that VE was recommended for use on construction projects (Dunstone, 1970; Gilleard, 1988; Chamberland, 1989).

The use of VE in construction is defined as a creative organised approach whose objective is to optimise cost and/or performance of a facility or system (Dell Isola, 1982). Having reviewed the literature on this subject it appears that divergences in methodology are rare. The US practitioner makes use of structured studies (job plans) over a period of 40 hours in many cases (Miles, 1972; Mudge, 1972; Dell Isola, 1982;1984;1989; O' Brien, 1976; Snodgrass and Kasi, 1986; Stylianopoulos, 1989). The study can be considered as a function oriented appraisal of all the elements of an item, system or process to achieve essential characteristics at minimum overall cost. Other techniques include the Value Management audit, the contractor's Value Engineering Change Proposal, the design charrette (Copperman, 1989; Kelly and Male, 1990; 1993).

In general the cost of implementing change increases as the project life cycle proceeds (Dell Isola, 1982; Kelly and Male, 1990;1991;1992). The earlier VE is applied the greater the possibility of significant cost savings and breakthroughs, but the more difficult it is to determine cost implications. The VE methodology advocates the use of lifecycle costing to optimise the value over the life of the facility. Only 20% of the client's cost goes on the initial cost, 35% goes on maintenance and operation and the rest on debt service. It is clear that the

technique must address the full implications of the design on the operation of the facility (Heath, Barham and Edwards, 1990; Kelly and Male, 1993; Dell Isola, 1982; Hatwell 1993). The VE methodology may be utilised as a decision making process for the client to define the optimum design to meet their specification at the minimum cost (Kelly, 1990; Barton, 1990; Johnson, 1990; Rosenfeld, 1990). This has otherwise been labelled the value standard, defining a point in the plane set by cost and functionality time and quality requirements (Bartlett, 1989).

The value deployment by functions used in the VE studies allows the project manager to realise the cost associated with each of the client requests. Functions can help to define the needs, wants and desires of the customer, placing functions in precise order enhances the understanding of the problem (Snodgrass and Kasi, 1986). This takes the analyst from a general understanding to a specific understanding and therefore to products of better value to the customer.

The VE study produces a number of benefits for the project (Kirk, 1989; Sperling, 1989; Barton, 1991):

- It is more effective than cost or design reviews in identifying areas for saving
- It is extremely cost effective
- By challenging the fundamental basis and design criteria of the project design, VE uncovers surprising savings opening up new design possibilities
- Repeat savings can be made on large projects
- Feedback of savings into the organisation may reduce costs of future projects
- It involves the client in key design and planning decisions improving communication.
- It can be used as part of the early project planning

Advocates of the US method of VE are many, however there are those that believe the specific methodology utilised in the US is not entirely suitable to the UK (Male and Kelly, 1991; Palmer, 1992; Ellegant, 1991; Barton, 1991). The developing thoughts in this area are that the building must be considered in its

entirety, forming part of a wider system. This holistic, systemic view of the project allows additional benefits in the form of:

- The project team can identify the wider system of which the project makes up a part.
- The system as a whole will perform more economically than optimisation of individual parts.

Whilst these benefits are recognised it has been suggested that the UK construction culture, due to the difference in cost management from the US (Carr, 1987), may benefit from a more holistic approach. Kelly and Male (1991) and Palmer (1992) draw a comparison between the US method of value engineering and UK cost management by quantity surveyors. They concluded that the task conducted in each case was fairly similar, the advantages gained by VE being those of independent review by a multidisciplinary team. Kelly and Male (1993) agree that the use of functional analysis and other problem solving tools within a multidisciplinary team can provide insights into projects for client organisations. They go on to argue however, that this must be based within the client's decision making process, as more of a philosophy than a technique. They develop a structured ongoing process of seven levels of increasing specificity making up the economic management of projects within the context of the client's value system.

It can therefore be concluded that the value engineering approach can be utilised in a suitable form to increase the value of the product during the design and construction process. Early analysis ensures maximum value for money and challenges the fundamental principals behind the project.

5.4.3 Summarising the achievement of project value

The early part of this section has addressed the means by which project value can be enhanced through management of the process and later through management of the product. It has become clear that there are various techniques in operation that can lead to value optimisation:

- Project partnering; constructibility improvements through alternative procurement routes; pre qualification of contractors; continuous risk analysis; management of site logistics and productivity.
- Design management; design standardisation; value engineering and value management philosophy.

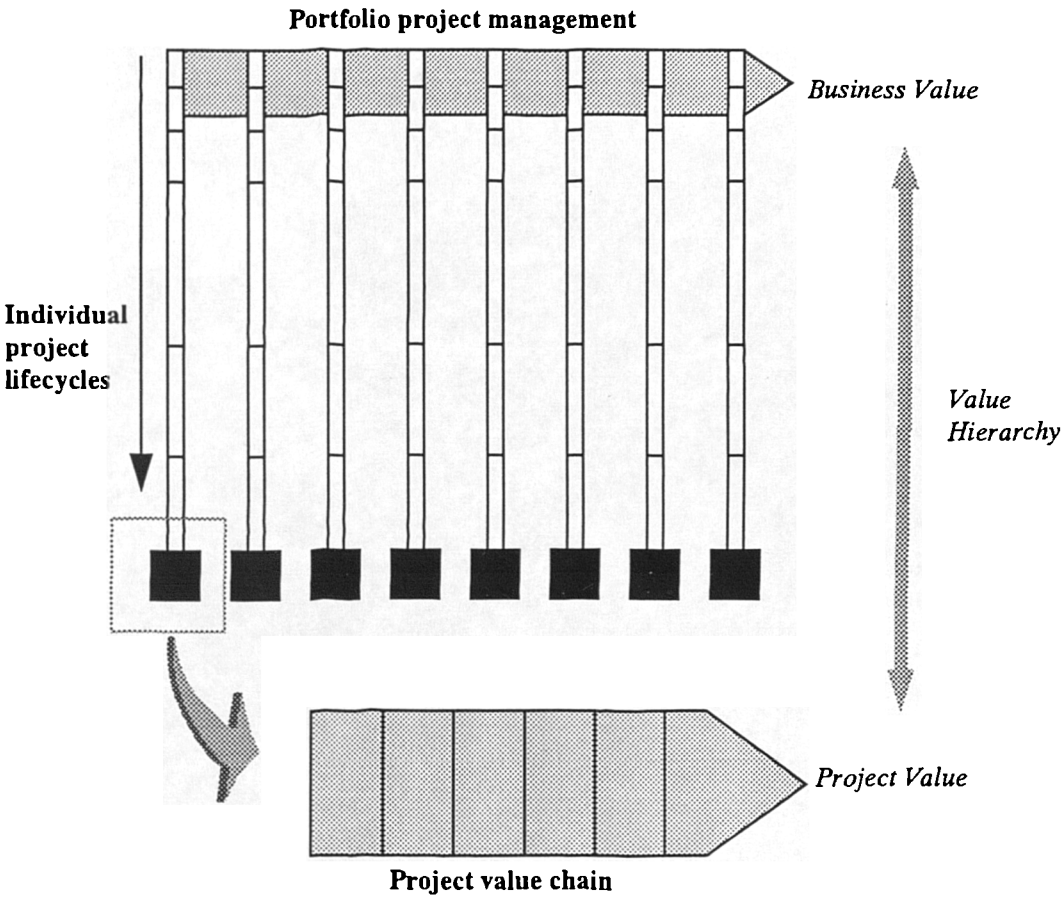
The first group of these techniques align to break down the barriers to value by forming bonds and communication paths to transmit value messages throughout the project organisation. The second grouping actually manages the design of the project within the project parameters set by the client. The management of product value therefore calls for a balance of scheduling, cost estimating, value management and design management. This should be a structured and systematic reduction of uncertainty: from master schedules and cost models at the planning stage to detailed cost estimates, cost / need matrices and detailed schedules as the design develops.

5.5 Project value towards corporate objectives

So far this chapter has shown how value may be added through the project life cycle by use of management techniques and controls. The achievement of value for money for the building client will be experienced on completion of the project and value realisation will come some time into occupancy when the client experiences the quality and functionality requested in the brief.

Each project makes up part of a portfolio of projects adding value to the business. It is only through the achievement of individual project value that the objectives of the project portfolio will be realised. This closes the value triangle by linking the project value to the business value. The relationship is schematically presented in figure 5.12: each project has both a lifecycle aspect and a portfolio aspect. Literature in this chapter has focused on methods to enhance value through the lifecycle of the project. Each of these is linked early in its life cycle within the project portfolio when the strategic decisions are being made for the project.

Therefore it can be seen that the management of the portfolio of projects defines the path which the project will follow, by setting the initial parameters for the project. The lifecycle management of individual project ensures value is added along that path. Thus in order to fulfil the corporate objectives it is important that both the early strategic parameters are set in accordance with the corporate objectives and that these are then lived out by the management of the individual projects.



Value is added through the value chain of the individual projects, this is then compounded through portfolio project management to create business value. It is only by adding value through individual projects that business value can be achieved.

Figure 5.12 The link between project value, business value and corporate value, Source: Author, 1994

In reviewing the literature it has become clear that the portfolio management of projects is reviewed independently from the management of individual projects. It is clear from the above discussion that a link must be forged between the strategic portfolio management of projects and the continuing tactical management of projects.

5.6 Summary

This chapter has reviewed the literature on project value, ie the enhancement of value through the management of individual projects. The construction industry was shown to present particular value impeding characteristics to the project manager. The were categorised into three sources:

- The nature of buildings
- The nature of the construction industry
- The nature of the building client

In order to overcome these impediments the manager must manage both the process value and the product value. This chapter has reviewed the methods in each one of these categories highlighting best practice in each area.

The discussion drew a comparison between the construction practice in the UK, US and Japan. It has become clear that the Japanese strength lays in their deep culture of mutual trust and long term relationships. The interpretation of value is common among the whole supply chain, as the value message is communicated and developed collectively. The nature of the general contractor in Japan also allows management of difficult interfaces within the project lifecycle, since the general contractor offers a full services and the constructor works alongside his own designer from day one.

The United States construction industry benefits from its drive to succeed. The client is fully involved in the extensive early investigation into project requirements leading to a clear definition of value. The use of standardisation in the US has a ripple effect throughout the industry as demand has facilitated the achievement of mass production.

Designers have accepted the benefits of standardisation and the use of contractor and supplier input at an early stage.

This review has identified areas of distinctive competence in each of the US and Japanese industries over that of the UK. This highlights therefore the opportunity to learn from the practice in each of the regions.

Having identified that value may be added by through the process of the project, the next chapter will identify the criteria for achieving value. Chapter 6 will draw upon studies conducted over the past decade investigating the achievement of success (otherwise considered value) in construction projects.

6 INTRODUCTION

Chapter 5 concluded that the project forms part of a network of value adding activities within the value hierarchy. In this set up the individual project is seen to add project value supporting the project portfolio which in turn adds to the business value. It was shown the importance of systems to control and manage the value due to the high level of value impedance witnessed within the construction industry.

This chapter will focus on specific areas whereby the project manager can improve the chances of success, where success may be defined as a specific interpretation of value for the project. The chapter will review the definition of success then proceed to analyse the criteria for achieving this success definition. These criteria will be generated following a review of the studies conducted in this field over the past decade.

The features that distinguish the construction project from others are those features that place the construction project client in a position of reduced probability of success. But what is success? and is the definition of success the same for all parties to the construction process?

6.1 The definition of success in construction projects

The basic unit of an overall program of development is the project. Control of a multi-project environment depends upon the success of individual projects (Angling, 1988). Success means a variety of things depending upon perspective and the method of measurement. In the past budget and schedule parameters proved an easy measure of a projects success and therefore became the guiding directors during project implementation. This does not however consider those projects that met their time and budget criteria but proved functionally unsuitable; or those projects that were late and ran over budget but were deemed to be successful. This dichotomy has led to a number of alternative definitions of project success to include the broader dimensions of project management.

The first distinction to make is that between project success and project management success. The former of these is considered as overall success, whereas successful project management can contribute to project success but is unlikely to be able to prevent project failure (De Wit, 1988). It is therefore fair to say that the project success is dependent upon factors extraneous to good management.

This is confirmed by Morris and Hough (1986) as they include project management as on of their four measures of project success (Morris and Hough, 1986):

- *Project Management* - Was the project implemented to budget, on schedule, to technical specification?
- *Project Functionality* - Does the project perform in the way expected?
- *Contractor's commercial performance* - Did those who provided a service for the project benefit commercially?
- *Efficient termination* - If the project needed to be cancelled was it made on a reasonable basis and terminated efficiently?

Another interpretation of project success is offered by Baker, Murphy and Fisher (1988: p903):

"If the project meets the technical performance specifications and/or mission to be performed, and if there is a high level of satisfaction concerning the project outcome among key people in the parent organisation, key people in the client organisation, key people on the project team and key users or clientele of the project effort, the project is considered an overall success".

This highlights the necessity for the projects to satisfy all "key people" or stakeholders to the project. It is subsequently suggested (De Wit, 1988) that the most appropriate criteria for success are the project objectives. The degree to which these objectives have been met determines the success or failure of the project. However, there is a hierarchical dimension to success as the primary objectives vary for each level of management in the organisation (De Wit, 1988). It is therefore necessary to consider the objectives of all the stakeholders throughout the project lifecycle and at all levels of the management hierarchy. (It is inferred that the measurement of success is

"somewhat an illusion" as the objectives of the stakeholders are unlikely to be congruent).

Ashley, Lurie and Jaselskis (1987) construe success as results much better than expected or normally observed in terms of cost, schedule, quality, safety and participant satisfaction. Results from a study of eight companies and sixteen projects indicated that six criteria are used most frequently to measure success: *Budget performance, schedule performance, client satisfaction, functionality, contractor satisfaction and project manager/team satisfaction.*

Once again this definition relies on perceptions of what is meant by satisfaction. There must be a measure to identify what satisfaction means. Sanvido et al (1992) echo this thought by suggesting that each of the project participants have their own viewpoint of success.

The factors that go toward defining success on a given project should be identified at the start of the project. They are effectively the value criteria, ie those factors at the end of the day that will realise value for money for the client and indeed anyone involved in the project process. When defining the criteria for measuring success a number of factors must be considered:

- Each project is unique and therefore requires a specific definition of success
- All success criteria of all stakeholders should be considered
- Compromise may have to be made between the incongruent objectives of each of the parties
- Project success and project management success should be distinguished from one another.

With this in mind, it is possible to define a number of criteria to improve the probability of achieving success as defined above. The following section will conclude the results of a number of studies that have taken place to define critical success factors.

6.2 Criteria for achieving project success

In the knowledge of the difficulties of achieving success in construction projects and the poor history of construction project management many studies have been conducted in the past decade to search for the factors that result in a successful project. These studies have encompassed observing projects, questioning project managers, conducting vast literature reviews and studying specific projects, both successful and unsuccessful. *(for example: Ashley,Lurie and Jaselskis, 1987; Baker, Murphy and Fisher, 1986; Beale and Freeman, 1991; Birchall and Newcombe, 1985; Bresnen et al, 1990; Cleland, 1986; Davidson and Huot, 1989; De Wit, 1988; Graham, 1988; Holt, 1989; Jafaari and Schuls, 1990; Laufer, 1990; Lewis and Jens, 1987; Milosevic, 1989, 1990; Morris and Hough, 1986; Morris, 1989; O'Reilly, 1987; Pinto and Slevin, 1986; Sanvido, Khayyal et al, 1990).*

This research has lead to the identification of elements that must be present in order to achieve a successful project. These are the Critical Success Factors (Sanvido et al, 1992: p97).

The researchers present their interpretation of the criteria considered to be critical to achieving success as judged at the end of a project. A summary of these studies and the results found have been tabulated and can be found in table 6.1, found at the end of this chapter. In reviewing these factors for this research they have been grouped under a number of headings according to common themes, drawing specifically on the work of a selection of these researchers to illustrate significant points in the analysis.

Beale and Freeman (1991) identify three types of variables that affect the success of a project:

- Variables exogenous to the project reflecting the inherent nature of the project
- Variables exogenous to the project team occurring early in the life of the project, such as clarity of objectives, support by parent organisation, provision of resources
- Variables endogenous to the project which are more readily changed by the project team, such as project organisation structure, project team skills and experience.

It is clear that variables exist over which the team have little control and therefore for which plans must be made and risk management must be conducted. In addition there are those variables over which the project team have full control and therefore requiring clear systems and good management.

In sympathy with this view many of the researchers identify criteria which are strategic in nature relating to environmental analysis and careful planning at the start of the project. This calls for an holistic approach to projects whereby the project is seen as part of a wider system (Morris, 1989). Pinto and Slevin (1986) delineate a strategic phase of the project and a tactical phase, being *"both sequenced and independent"* (Pinto and Slevin, 1986: p488), indicating a spectrum of skills required to accommodate the different critical success factors as the project proceeds. The strategic part of the project is concerned with the upfront planning, while tactics are specifically focused on how best to operationalize, or achieve, those plans. A combination of strategy and tactics effectiveness leads to a high probability of implementation success (Pinto and Slevin, 1986).

Many of the critical success factors are identified as being the domain of the client organisation and the client's project manager (Cherns and Bryant, 1984). These management issues span both the strategic and tactical phases as identified above. The flow of information and communication has much impact on the success of a project especially information flow between phases of the project and across environmental boundaries. It becomes clear therefore that the project manager is dealing with different issues at each stage of the project and the interfaces between these phases (Baker, Murphy and Fisher, 1989).

In summarising these points a number of major issues can be identified under which the critical success factors from a client perspective may be grouped:

- Strategic critical success factors
- Tactical / Management critical success factors
- Interface critical success factors

These groups will each be discussed in order to highlight factors that require attention in order to improve the chances of success.

6.2.1 Strategic critical success factors

This category of success factors is concerned with the broad issues of the organisation and combines the project with the strategic issues of the organisation. These issues are generally addressed by top management within the organisation, taking on a long term time scale. Table 6.2 highlights the major characteristics of the strategic activities falling into this category. Failure to address the issues in this category may lead to misuse or failure of the project (Pinto and Slevin, 1988). An ineffective project strategy will not halt the tactical phase but will remove from it the context within which the objectives should be fulfilled. This may be witnessed in practice as solving the wrong problem, even though the project's tactical implementation may have been successful.

	STRATEGY	TACTICS
Level within organisation issue is addressed	Top management	Mid to lower levels of management
Activities concerned with assessing project goals	Greater subjectivity used at strategic level	Less use of subjective values
Nature of problems arising	Unstructured, one at a time	More structured and repetitive
Information needs	Large amounts of information needed, much that is external	Need for internally generated, specific information
Time horizons of management's vision	Long term, but it varies by the problem	Short term and more constant
The degree to which scope of the organisation is considered	Covers the entire scope of the organisation	Concerned only with the suborganisational unit involved
The frame of reference of the activity	The source of all planning in the organisation is original	Done in pursuit of strategic plans
Concerned with how broad or specific problems are	Broad and general	Narrow and problem specific
Ease of determining effectiveness and efficiency of activities	Difficult because of generality	Easier, because of specificity
The focus of viewpoint of actors	Corporate	Functional

Table 6.2 Taxonomy of strategic versus tactical issues
Source: **Pinto and Slevin,** *Critical success factors in effective project implementation*, Project Management Handbook 2nd Edition, (Eds: Cleland and King), 1988, p492.

With reference to table 6.1 it is clear that many of these studies result in strategic issues being highlighted as factors necessary for project success. The project requires a sense of mission from the outset (Baker, Murphy and Fisher, 1988; Pinto and Slevin, 1988; Lewis and Jens, 1987), related specifically to the strategy of the organisation (Cleland and King, 1988; Birchall and Newcombe, 1985). Once the project has been borne out of the organisation's strategy the research has shown the importance of clearly defining the objectives in the form of a briefing document (O'Reilly,1987; Beale et al, 1991; De Wit, 1988). By taking a long term perspective, a realistic assessment of the project goals may be made. Top management support is highlighted as being crucial during these stages of the project (Beale, 1988; Pinto and Slevin, 1988).

The planning efforts should be well structured to ensure clear and meaningful decisions from within the client organisation (Laufer, 1990). It is during this stage that adequate funding should be secured (Baker et al, 1988), the scope of the project defined (Ashley, 1987) and plans established for the remainder of the project implementation (Pinto and Slevin, 1988; Ashley, 1988; Baker et al, 1988). In addition, plans for the management of risk, cost, information, procurement etc. should be set up at this time.

The success factors falling into the strategic category may be summarised by the following points:

- Determining the strategic fit of the project giving the project a sense of mission
- Defining the objectives of the project and its scope with clarity and viability
- Developing plans for the remainder of the project implementation including choice of management system, pre-selection of bidders, risk management, designing for construction, etc.
- These factors should be conducted with full support of and by top management.

6.2.2 Tactical management critical success factors

The factors that fall into this category are associated with the actual process or action of the implementation. They are specifically focused on how best to operationalise the plans set up during the strategic activities. Reference to table 6.2 indicates the activities are more problem specific and concerned with the project team rather than the organisation as a whole as in the strategic activities. The tasks are more structured and associated with more objective goals.

Ineffective tactics can lead to low acceptance and low use by organisational members for whom the project was intended or indeed project failure (Pinto and Slevin, 1989).

The tactical control systems mentioned in the critical success factor analyses are related to increasing certainty during the project implementation and documenting any changes such that project variables may be controlled. For example milestone schedules, change management reports, cost modelling, freezing design once agreed, risk analysis, logistics analysis, go / no go trigger points (Ashley, 1987; Beale, 1991; Cleland and King, 1988; Holt, 1989; De Wit, 1988; Kraus and Cressman, 1992,

Morris, 1989). It is also clear from table 6.1 that the provision of adequate resources could be a factor in the success of a project (Beale, 1991; Morris, 1989, Pinto and Slevin, 1988; Sanvido et al, 1992).

Whilst the critical success factors in table 6.1 highlight the need for adequate controls (Ashley, 1987; Beale, 1991; Holt, 1989; De Wit, 1988; Kraus and Cressman, 1992, Morris, 1989), surprisingly little emphasis is placed on specific tasks to be conducted during the tactical phase of the project. It seems that success is related more to project team attitudes, motivation, teamwork, leadership and skills. The project manager's experience, commitment to the project goals and the degree of empowerment from the client organisation also impact the success of the project (Ashley, 1987; Baker, 1989; Beale, 1991; Lovell, 1993, Sanvido, 1992). This is emphasised by Graham as he concludes:

> *"The next generation of project managers will not need training in techniques of cost control, probabilistic scheduling or risk analysis. But they will need training in man management, conflict management, team building and manpower planning"*
>
> Graham, 1988: p162

The project organisation structure must suit the task at hand (Morris, 1989), with flexibility (Lewis and Jens, 1987) to allow for efficient decision making in the absence of bureaucracy (Baker et al, 1989; Beale, 1991; De Wit, 1988; Sanvido et al, 1992). The project manager must be aware of the power and politics surrounding his/her project (Morris and Hough, 1986; Holt,1989).

It seems that the level of project team autonomy was found to be critical to success in a number of studies (Graham, 1988; Holt, 1989; Lovell, 1993; Baker, Murphy and Fisher, 1989). This is often difficult for the organisation to achieve since the level of risk and complexity results in many stakeholders all requiring a say in the direction of the project. It would seem feasible, however, to allow the project manager to manage the project during this tactical implementation in the knowledge

that the context has been established in the strategic stage. This leads to the final category of success factors as grouped for the purpose of this analysis: The interface critical success factors.

The success factors falling into the tactical category may be summarised by the following points:

- Devising suitable control systems to reduce uncertainty and document changes to the project scope and work definition.
- Selecting the project team according to their experience and develop a suitable project organisation structure to remain flexible to the demands of the project.
- Building the team into one with clear direction, strong motivation and learning.
- Empowering the project manager to allow him/her to manage the project through the implementation stages.
- Providing the project with adequate resources.

6.2.3 Interface critical success factors

The factors placed within this group are concerned with human, environmental and process interfaces. That is, ensuring that communication and information flow across these interfaces allow all the project stakeholders to work toward the same project goals.

This category overlaps with both of the previous two since the strategic and tactical phases must be interfaced (Morris, 1972). Therefore it may be that some of the critical success factors appearing in this category have been mentioned previously.

It is clear that the tasks in this group must determine and communicate a set of common objectives throughout the project organisation. The first stage of this is to define the actors in the project organisation and those exerting an influence on the project ie the stakeholders (Cleland, 1986; Cleland and King, 1988; Cohen and Harris, 1988; Pinto and Slevin, 1989). Having identified the stakeholders it is necessary to understand their requirements and the influence they may have on the project, both positive and negative (Cleland, 1986; Baker et al, 1989; Holt, 1989). In order to achieve this Bresnen (1990) considers that formal contact must be maintained with the user groups, and subsequently a network of communications to all key actors maintained throughout the project duration (Pinto and Slevin, 1989; Cleland, 1986).

In addition it is important to identify the interdependence with other environmental factors and assess the risk of their impact on the project (Graham, 1988; Lewis and Jens, 1987). These may include social, political, corporate or other factors with which the project manager may only have minimal influence. However, by being aware of the interface between these and the project, the project manager can develop contingency plans.

The literature pointed clearly to the necessity to fully understand the client's requirements and place them within a document to communicate to the remainder

of the project organisation (Graham, 1988; Holt, 1989; Kraus and Cressman, 1992; Morris, 1989; O'Reilly, 1987). In this way the interface between the project organisation and the client is sealed. The definition of the client requirements forms a thread through the project stages acting as a focal point for all decisions (Birchall, 1985). In a similar way Baker (1989) highlights the need to define the success criteria of the project such that the team are working towards a goal established at the start of the project.

A number of the studies highlighted the relationship between the contractor and the owner to be key to the success of the project (Milosevic, 1990; Sanvido, 1992; Lewis and Jens, 1987; Bresnen, 1990). Previous experience of working with the same contractor reduces the learning curve (Bresnen, 1990), encouraging mutual trust and sharing of information breaks down the barrier between the contractor and the owner to forge the interface (Lewis and Jens, 1987). Sanvido (1992) suggests the contracts should enable common goals, minimize conflict and allocate risk and reward where it is appropriate. By improving this relationship, the design and construction interface, which is referred to regularly in literature as a source of difficulty, may be managed, leading to construction oriented design (Morris, 1972;1989).

> *"Two of the initial decisions that are vital for project success are selecting the contractual approach and building the project team."*
> Tatum, 1987: pg100

DeWit (1988) presents his interpretation of a project success framework which explains the factors above. He suggests that both a horizontal and vertical hierarchy of objectives must be pulled into the project objectives. He also highlights the necessity to manage the interface between these objectives and the interface between the organisation and the environment.

Power within the client organisation and externally is referred to by a number of the researchers who consider the project manager the focus for much political activity which must be managed (Lovell, 1993; Morris, 1989). Power and politics is often the source of project conflict and lengthy decision making, leading to delay and frustration. The management of this conflict is highlighted as critical by Keszbom (1992). This point is confirmed by Cherns and Bryant as they conclude that "*many of the problems concerning design changes, delays and difficulties during the construction phase have their origins in unresolved conflict within the client organisation...*" (Cherns and Bryant, 1984: p182) The use of a project director to manage these political interfaces is recommended by Graham (1988), Pinto and Slevin confer this view by describing a project champion who takes on an entrepreneurial role to break down barriers to project progress.

The success factors falling into the interface category may be summarised by the following points:

- Establishing a formal network of communication between all key actors to define the requirements fully and establish a common understanding of the project goals.
- Identifying the project stakeholders, identifying their influence as positive or negative and establish a plan for the continuous management of communications, conflict and publicity.
- Managing the internal and external political interface possibly by the use of a project director.
- Developing contracts to encourage mutual trust and understanding between the owner and contractor, forging the interface between the design and construction phases of the project.
- Interfacing between strategic and tactical project processes.

6.2.4 Summary

Section 6.2 has reviewed the literature regarding the attainment of success in construction projects and concluded that project success factors may be categorised into three main areas. That is the strategic, tactical and interface success factors considered to be critical to the success of the project. The summarising tables highlight the factors that are considered necessary if the project is to achieve success.

Having identified these factors it is necessary to place them within a framework such that they may be combined to add value to the project value chain. The next part of this chapter will review the characteristics of a project management framework by drawing on these critical success factors and on the work of other researchers who have developed models for the management of construction projects. In this way it is anticipated that the nature of a project management framework required to ensure construction project value will be prescribed.

6.3 A framework for the successful management of projects

The use of a framework to assist project managers during the project lifecycle is sited on many occasions in the literature *(Baker, 1989; Beale and Freeman, 1991; Cleland, 1986; Holt, 1977; Cooper, 1988; Gardiner, 1992; Harris, 1992; Laufer, 1990; Milosevic, 1989;1990; Morris, 1991; Morris and Hough, 1987; Pinto and Slevin, 1989; Sanvido et al, 1990; Saunders, 1992).* In fact, Birchall and Newcombe (1985) actually highlight *"establishing the optimum framework for design and construction"* as one of their critical success factors.

Lillian and Kotler (1983) affirm the benefits of using models to assist decision making in a complex, difficult world. Models are considered to:

- reduce the risk of failure (Coxhead, 1992),
- impose consistency whilst being applicable to a wide range of projects (Harris, 1992),

- integrate decisions through a decision making process (Laufer, 1990),
- provide a common, generic and logical structure (Sanvido et al, 1990).

However, the nature of the models / frameworks presented in the literature vary, taking different perspectives and aimed at different levels of the project organisation. It is necessary therefore to draw common themes from these models and produce a framework to improve the chance of project success from the client's perspective.

A number of issues arise when attempting to develop such a framework. These are reflected in the models and process diagrams previously developed, as few fulfil the same characteristics or indeed fully represent the project management process from the client side. In reviewing the literature a number of contradictions arise regarding the nature of a model or framework to assist in the project management task:

- Should the model be holistic or made up of a number of independent "sub models"?
- Should the model be represented as a sequential or simultaneous set of tasks and stages?
- Should the model prescribe the project manager's duties at each stage or simply describe the ultimate conditions for project success to assist the project manager in his duties?
- Should the model be aimed at just the project manager or the whole organisation as a decision making framework?

In attempting to reach conclusions on these issues, each will be discussed with reference to the models in circulation at the time of writing and the success factors highlighted above. A conclusion will be drawn at the end of each section on the characteristics deemed necessary for the management of projects to ensure value added to the customer.

6.3.1 Holistic model versus sub models

Of the models reviewed it appears that there is a mix, ranging from those managing the project from an holistic, systemic viewpoint to those managing elements of the project that are considered important in their own right. The holistic models (Milosevic, 1989; Morris, 1989; Morris and Hough, 1987; Sanvido, 1990; Saunders, 1992) advocate the use of systems theory concepts, for example: environmental interaction, information flow across boundaries, feedback amongst subsystems, etc. These models present the process as part of a wider system that must be managed as such and therefore managed as a whole.

> *"Effectiveness of the PMS (project management system) depends on the effectiveness of these constituent elements individually, as well as on how these elements are synergized into the PMS, since it operates as an entity. It is the way in which the PMS works in its environment that ultimately determines its success or failure."*
>
> Milosevic, 1989: p173

The systems approach is considered suitable due to the level of human interaction required, the reduction in complexity afforded by the analysis. Systems theory is considered to promote innovative and unconventional thinking, taking a view from outside of the project management hierarchy (Saunders, 1992). Davidson (1989) identifies the need for a new model based on open systems to replace the classical approach. He considers the classical approach *"emphasizes the operational control to the detriment of strategic control and does not give sufficient emphasis to policy priorities".*(Davidson and Huot, 1989: p139)

Milosevic considers that all too often, the approach in solving project management problems is through "solving partial problems within the individual stages that make up the project" (Milosevic, 1989: p173), concluding that this is no longer sufficient for the completion of a successful project. However the authors of these sub models consider that particular elements are important enough to warrant individual models.

The type of areas considered with these submodels are:

- value management
- schedule and cost management
- procurement decision making
- risk management
- quality management (Ledbetter and Burati, 1990)
- models for achieving constructibility (Tatum, 1987)
- planning (Laufer, 1992).

The issues concerned with these elements of the building project are vast and all form an aspect of the critical success factors highlighted in the last section.

It would appear that these two viewpoints are not in total disagreement. To the contrary the submodels form the tools for use in an holistic model, leading to the successful implementation of the elements of the individual stages as well as the successful interaction between them. Each cannot be considered in isolation as an independent model since their complex interrelationship leads to a knock on effect when changes occur in one of these models. In conclusion therefore the use of an holistic model with reference to specialist submodels is recommended. In his model, developed for IBM, Harris (1992) comes close to this whilst only providing an outline of the submodels to be used.

6.3.2 Sequential or simultaneous tasks

The make up of the models vary from those offering a sequence of stages to be completed in order (Holt, 1977; Kotler, 1986; Cooper, 1988; Shivastava and Souder, 1987; Harris, 1992; Laufer, 1990; Pinto and Slevin, 1989), to those calling for a more simultaneous approach to the elements of a project (Beale and Freeman, 1991; Cleland, 1986; Milosevic, 1989; Morris, 1972; Morris and Hough, 1987; Saunders, 1992). The sequential models have been used for many years in the manufacturing industry during the development of new products (showing very similar traits to the development of a building). In this case the stages are laid down with decision points or "gates" (Cooper, 1988), where go / kill / hold decisions may be made. The sequential process allows for structured decision making during the evolutionary

process of planning then implementing a project (Laufer, 1990). It provides a chain of information which must pass particular hurdles before the project may continue; it allows the project manager to re examine previous stages, objectives and decisions via feedback. Unfortunately these models, whilst providing the project manager with an overview of the stages and requirements at each stage, appear a little sparse of information and guidance.

Concluding his PhD thesis in 1972 Morris highlights an evolutionary interface between the strategic and tactical phases of a project, producing a broad sequential model, whilst emphasising flexibility....*"A project unfolds through time and all the subsystems are connected temporarily"* (Morris, 1972: p58). This hints at the use of a model where the project manager has more flexibility in the order in which the tasks are conducted and the stages completed. The other type of model is that which presents the tasks as concurrent or simultaneous (Cleland, 1986; Milosevic, 1989), "*...a rugby scrum strategy which has led to dramatic reductions in the time span of the development cycle*" (Lorenz, 1987 in Coxhead and Davis, 1992). In addition to the models presenting simultaneous stages, there are those that present a "static" interpretation, describing the ultimate conditions for success (Beale and Freeman, 1991; Morris and Hough, 1987; Baker, 1989). These provide information in a loose form, leaving the project manager to decide how and when to apply the factors held within. Beale and Freeman consider that success will be achieved by *"...adequately controlling the critical variables"* (Beale and Freeman, 1991: p27). Morris and Hough (1987) present a model articulating the environment that must be managed if projects are to be managed more successfully.

Table 6.3 compares these two approaches, each having evolved to fulfil a particular role

Strictly sequential	Concurrently developed
Has been criticised for being too slow leaving the way open for competition	Dramatic reductions in the time span of the development cycle. Therefore reduces the urge to miss vital stages
More prudent approach benefiting from the gradual learning	Allows concurrent development and increase probability of design and construction being interrelated
Ensures nothing is overlooked whilst imposing a level of bureaucracy into the process	If completed sooner the end product will relate better to the original needs of the consumer

Table 6.3 Comparison of sequential and simultaneous development. Source: Adapted from notes in **Coxhead and Davis**, *New product development: A review of the literature*, Henley Management College working paper, 1992, p12

It would appear therefore that the two types of model have their advantages and disadvantages and the choice must be suited to the context within which the model is to be used and the nature of the client organisation. The structural benefits of a sequential model must be balanced with the coordinating benefits of the simultaneous model. The flexibility should therefore exist within the research preliminary model to allow the stages to overlap and interlink thus ensuring that the interface critical success factors are achieved.

6.3.3 Prescriptive versus descriptive model

The models currently available take a variety of forms varying from those that prescribe the actions to be taken by the project team members at each stage to those that simply list a number of success factors to be addressed to secure a successful project. The prescriptive models (Holt, 1977; Kotler, 1986; Cooper, 1988; Shivastava and Souder, 1987; Harris, 1992; Laufer, 1990; Pinto and Slevin, 1989) provide advantages in that they illustrate in detail the tasks required and therefore ensure that the project team fulfils all necessary stages through the project's

lifecycle. The descriptive models (Beale and Freeman, 1991; Cleland, 1986; Milosevic, 1989; Morris, 1972; Morris and Hough, 1987; Saunders, 1992) are more loosely structured, whilst showing the feedback and linkages between the factors. This allows the project manager to interpret the model in relation to his / her own project, thus enabling autonomy. These models also encourage the project manager, by leaving the model open, to consider these aspects and success factors in the specific context of the project in question. The advantages of this, compared to the more prescriptive model, which could be seen as being bureaucratic and constraining, may outweigh its disbenefits.

When one looks at the critical success factors it becomes evident that structured communications, structured decision making and control mechanisms are related positively with achieving project success. This must be balanced with project team autonomy and mutual trust and coordination between the whole project organisation. The conclusion therefore is to develop a formal framework for the project manager, whilst allowing them the flexibility to use this as simply a framework from which to develop their project specific model.

6.3.4 Focus of model

Most of the models reviewed are aimed at the project manager as a device for achieving success. However, it has become clear throughout this discussion that the client has a significant role to play in devising the project strategy (Cleland and King, 1986; Pinto and Slevin, 1989; Holt, 1989; De Wit, 1988). The role the client must assume during these early stages is one of strategic management, conflict and power management and requires visionary scope (Cherns and Bryant, 1984). In addition to this a strategic view of the project portfolio must be assumed in order to ensure the organisational objectives are met (Angling, 1988; Fangel, 1983; Gareis, 1989;1992; Roetheli and Pesenti, 1986). It may be, therefore, that one could argue the need for the whole organisation to be party to the project management model; for the model to gradually focus from being an aid to decision making in the initial visionary stages, to being more focused as the project enters implementation.

Cherns and Bryant (1984) describe the client as being a "complex, non unitary body", which implies the combining of many different areas of the client organisation. However, a project management model will need to be controlled from one point within this client body. Baker et al have produced a model consisting of the tasks required by the key persons in the project process across the three phases of the project (described as the conceptual phase; bid, proposal, contract definition and negotiation phase; implementation phase (Baker, Murphy and Fisher, 1986)). The key persons are defined as:

- The client organisation and / or the principal client contact
- The parent organisation and / or the principal parent contact
- The project manager and / or the project team.

The success factors concluded in section 5.3 also highlight the importance of maintaining structured communication with the project stakeholders. This may mean that the more important stakeholders need to become involved in the implementation of the model.

It is necessary therefore to define the focus of attention of the model such that it's flow is maintained at all stages of the project whilst involving the necessary persons.

6.3.5 Required characteristics of model

From the above discussion and the factors highlighted in section 5.3 it is possible to identify the characteristics of a model to achieve success during the life of a project. These have been summarised in the form of a schematic for simplicity, highlighting the characteristics that must be considered during the development of the client's strategic project management framework in the synthesis chapter.

The model developed must form a synthesis between the characteristics of a generic model, the success factors for a construction project, the nature of airport projects and the characteristics of the client organisation within which the model will be utilised.

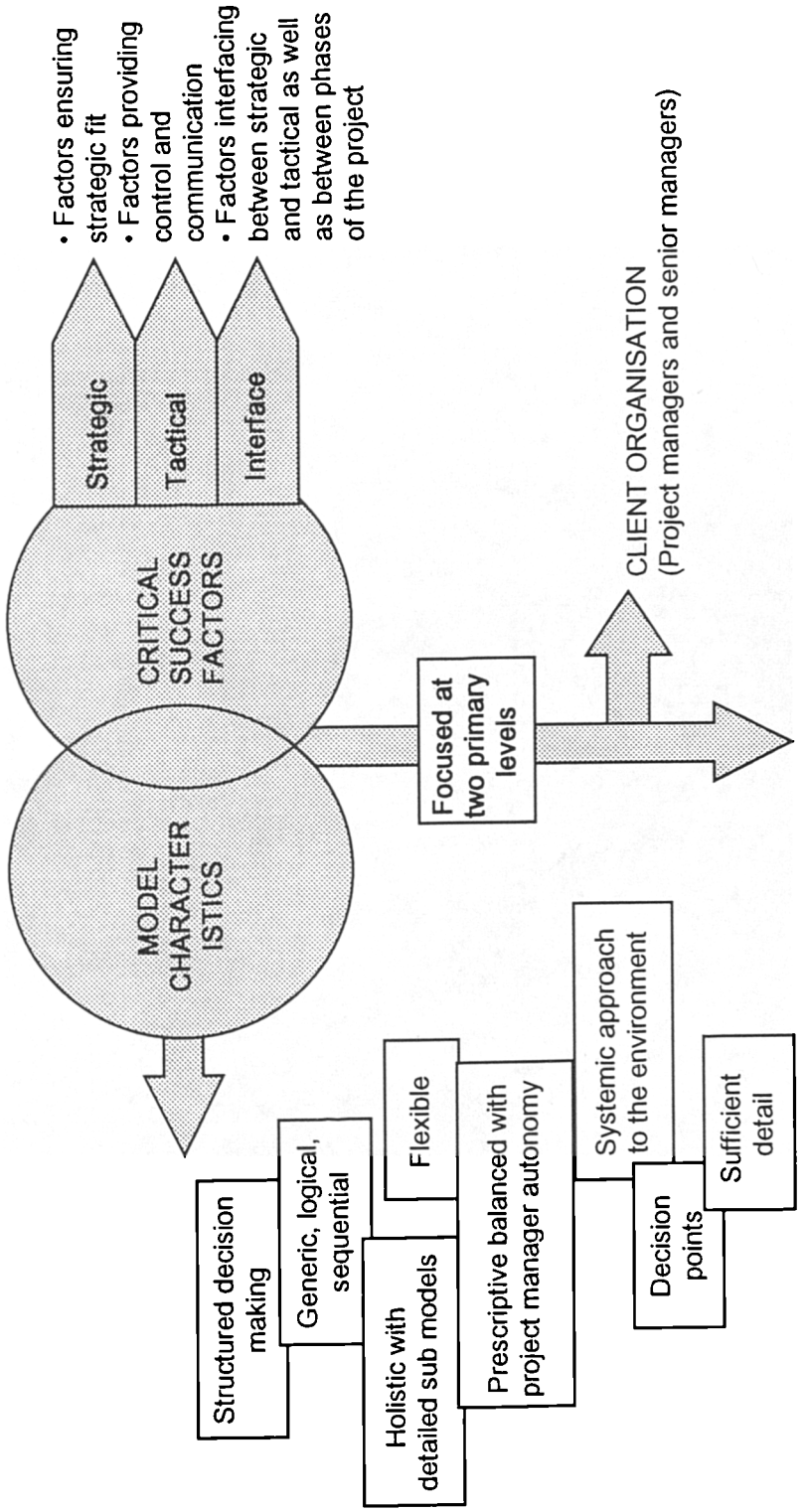


Figure 6.1 A summary of the requirements that must be provided by a model for the strategic management of projects Source: Author 1994

6.4 Summary

This chapter has developed an argument for the use of a model to assist the client project manager in the strategic management of projects. The discussion opened with a definition of projects, leading into the specific complexities of construction projects. It has been suggested that there are three possible sources of complexity: the nature of buildings, the nature of the construction industry and the nature of the client organisation within which the project is to take place.

Construction project success has been defined as unique to each project, dependent upon the "client's" perception of satisfaction. However, success can be measured according to the following generic features: project management, project functionality, contractors commercial performance. In addition efficient termination may be a measure of success if appropriate. Studies have been conducted in order to prescribe the factors necessary for the achievement of project success. These have been found to very in nature and results, whilst owning common features and conclusions. By way of a summary of the critical success factors it has been suggested that the factors can be grouped into three categories:

- **Strategic success factors**: Ensuring strategic fit, defining the scope of the project, defining the project objectives, planning for the implementation of the project, achieving full support of top management.
- **Tactical success factors**: Control systems to reduce uncertainty, selection of project team, clear direction and strong motivation of team towards common goals, project team autonomy.
- **Interface success factors**: Establish a formal communications network, manage the project stakeholders, conflict management, manage internal and external political interface, employ a project director, encourage mutual trust, reduce barriers between design and construction.

In order to capture all of thee factors for success, it is suggested that the client organisation employ a framework to ensure consistency and a logical sequence of decision making through the project lifecycle. The discussion reviewed the work of other researchers in this field and concluded that the model should take on the following characteristics:

- A systems approach
- An holistic approach whilst detailing sub models
- A generic, logical decision making progression
- A sequential framework allowing for overlap of stages
- Prescriptive, balanced with project manager autonomy
- Presenting decision points and milestones
- Defining structured communications
- Focused at two primary levels: the client organisation and the stakeholders.

This chapter has therefore set the guidelines for the development of a project management framework for the sponsoring organisation. The next chapter will synthesize the information from the previous chapters in developing a model to manage construction projects within BAA plc enhancing the value added to the business.

Authors	Date	Critical success factors
Ashley, Lurie and Jaselskis	1987	Scope and work definitions Planning efforts Project Manager goal commitment Project Manager capabilities Project team motivation Use of control systems
Baker, Murphy and Fisher	1988	Clear understanding of cost, schedule and technical performance goals Minimize public participation Ensure a sense of mission from the outset Adequate funding to completion Clearly establish the success criteria On site project management Absence of bureaucracy Provide a task orientation
Beale and Freeman	1991	Clarity of objectives Continuous support by parent organisation Adequate provision of resources Suitable project organisation structure Project management/team skills and experience Effective planning and control systems and procs.
Birchall and Newcombe	1985	Establish an optimum framework for project management Early involvement of the project manager Establish the realistic viability Understand the business targets Monitor internal and external consultants Decision management Adequate project definition Careful change management
Cleland	1986	Continuous stakeholder management
Cleland and King	1988	Define key result areas against which project should be judged Determine the strategic fit of the project Project audits in the form of Go/No go triggers Clearly define project participants

Table 6.1 A summary of critical success factors identified in the literature

Authors	Date	Critical success factors
Cohn and Harris	1988	Manage the environmental impact
De Wit	1988	Realistic and thorough definition of the project Comprehension of the project environment Careful selection of organisation to realise project Sound project policies and controls
Graham	1988	Minimize interference from external forces by use of a project director Manage the social, political and corporate env. Information Management Project manager/team autonomy and motivation Careful project planning
Hall	1980	Planners need to make a more conscious effort to forecast the world in which decisions are made Production of better balance sheets of cost and benefit Take explicit account of the political environment surrounding the project
Haslaam, Bresnen, Beardsworth, Bryman and Keil	CIOB paper No.42 1990	*Performance increases with:* Choice of correct management system for the project Careful strategic decision making by clients Previous experience with working with the same contractor Formal contact with user groups
Holt	1989	Take a long term perspective Detailed development of client's need analysis Project team autonomy Leadership providing clear mission Maintain constant feedback of results Be aware of internal politics Encourage shared values
Kezsbom	1992	Identify and manage conflict
Kraus and Cressman	1992	Define client requirement and order in priority Develop a project strategy - milestone schedule, contract strategy, cost model Continuous monitoring - Identify scope changes and update documents
Laufer	1990	Structured planning efforts

Authors	Date	Critical success factors
Kharbanda and Stallworthy	1983	
Lewis and Jens	1987	Perform predetermined mission Maintain internal and external publicity Owners and contractors to establish mutual trust and share information Project Manager with strong interpersonal skills Flexible project organisation Plan and replan organisation strategy
Lovell	1993	Manage political power within project organisation Project manager empowerment Project team members to participate in decision making Set meaningful goals
Milosevic	1989	Integrate owner and contractor organisations Control the environment Control interdependencies
Morris	1989, 1991	Assess local community sensitivity and manage Ensure positive client attitude Comprehensive and clearly communicated project definition Design interface management Project organisation suitable to project type Consider innovations in contract strategy Test design before final commitment Freeze design once agreed Phased project definition Schedule to take full account of phasing logistics, environment etc. Avoid concurrency where possible Firm effective leadership and team work Adequate resources with excellent communication Full analysis of project risks

Table 6.1 A summary of critical success factors identified in the literature

Authors	Date	Critical success factors
O'Reilly	1987	Identify participants and set up communications Define client requirements and communicate in a clear, prioritised, realistic, flexible brief
Pinto and Slevin	1988	Define the underlying purpose for the project Suitable nature and amount of top management support Develop detailed plans of the required stages of the implementation process Define a project champion to be project entrepreneur Define users and maintain consultation to gain support and understand needs of all impacted parties Ensure timely and controlled information Monitor and give feedback between stages Network of communications with appropriate data to all key actors in project implementation *Success will be affected by:* Recruitment, selection and training of personnel Availability of required technology and expertise Ability to handle unexpected crises and deviations from the plan
Sanvido, Kumara, Kamarthi and Khayyal	1990	Contracts enabling common goals, minimizing conflict and allocating risk and reward where it is due Well organised and cohesive team Experience in similar projects Adequate resources Timely information from all parties in the planning and design process

Table A summary of critical success factors identified in the literature

Part Four

Research data collection and analysis

In Part Four the research model is established, the results of the research tests reported and the analysis of the results discussed in order to develop a model for the strategic management of major projects for BAA plc.

Part Four is made up of five chapters:

Chapter Seven:	Model synthesis
Chapter Eight:	Research methods
Chapter Nine:	Results
Chapter Ten:	Discussion
Chapter Eleven:	Conclusions

7 INTRODUCTION

The themes developed through chapters three to six have moved through a series of interrelated subjects each contributing to the fulfilment of value for money within a business environment. Chapter 7 will draw these concepts together, in the context of the airport business established in chapter 2, in synthesising a model for the management of major projects within an airport company.

Chapter 7 will therefore review the characteristics of the airport industry that result in the need for a model to assist the decision making processes within the client organisation. It will marry this with the characteristics of the airport customer: a multi headed, influential customer group. The discussion will highlight the delineation between the early strategic emphasis and the later tactical emphasis required of the model to fulfil the fusion of corporate, business, and project value criteria.

Having established the framework for the model, the chapter will continue to develop the detailed stages of the model, combining the conclusions from the previous chapters with the results of the pilot study (reported in chapter 8). The preliminary questionnaire and interviews unveiled a number of fundamental criteria from which the model was developed, it was therefore considered necessary to include the results of the pilot study within this chapter. As the model is developed the discussion will highlight, in italics, important features forming the characteristics of the model. This will assist the reader in formulating the argument behind the model which will be presented in full at the end of the chapter.

7.1 The philosophy behind a model for the project process

Chapter two concluded that the core business of an airport organisation is no longer simply a nodal interchange between various modes of transport; on the contrary it has become a growing commercial enterprise. The airport business is becoming more geared toward providing the customer with a service as he or she passes through the airport in pursuit of air travel. This has broadened the airport model into one where

the primary objectives have shifted to one of commercial efficiency and profit orientation. As discussed in chapter 2 the core business of BAA plc is focused on four elements:

- Airport operations
- Retail services
- Property and related business
- Major project development

By examining this list it could be argued that *major projects development* is as important to BAAs business as retail or operations (customer service). Major projects have been clearly identified as part of the core business and therefore key to the future development of BAA plc. Whilst the airport's sole purpose is not directly achieved through major projects, they are necessary for development and to satisfy the customer. Without expertise in construction project management it would not be possible to grow and develop in the other areas of the core business.

The growth of the air transport industry is forecast to continue into the next century. The forecasted passenger flow through airports globally is set to double in the next fifteen years. This alone presents problems in terms of capacity to the airport operators, not withstanding the threat from external forces in the form of security and terrorist threats; competition; air traffic congestion etc. Long term planning in airport infrastructure is paramount if BAA plc is to remain in the competitive arena. BAA plc is currently spending in excess of £300m per year on airport infrastructure. It is estimated that capital spend in the next three years will total £1.4bn and to the year 2000 will total £3bn. Airports the world over are undergoing major development in an attempt to meet the demand for air travel. These characteristics compound to emphasise the necessity to investigate the best way of conducting airport development to achieve value for the business.

►*A model is required to manage the major projects process to add value to the business.*

Achieving value within the airport business has it's own particular complexities: the airport industry is subject to many environmental forces, many of which combine with the airport industry to form the air travel "experience" for the passenger. In order to create optimum value to both the customer and the airport business, environmental interaction is required. It has been indicated that the project process is itself sparked by changes in this environment and therefore must remain open to the environment. Any model of the project process must therefore be systemic, allowing the transfer of information and communication between the environment and the project. The airport project is significantly prone to environmental influence due to it's public nature, this emphasises the need for a model open to environmental effects.

►*A model is required that remains open to environmental influence and communication.*

Value is added to the business through implementation of the corporate strategy. Chapter 4 argued that projects form the mechanism for implementing the strategy, and that their holistic success is fundamental to the achievement of business value. The BAA organisation exists as a holding company with the airports operating as separate business units. Strategic direction should be achieved through corporate communication whilst business development should occur through the operations of the business units.

The organisational structure of BAA results in projects being managed locally to the individual business units. The control of these from a strategic perspective is maintained by Group Technical Services (GTS). In addition to this, GTS manage the projects with value exceeding £50m. Each of the business units conduct project management according to their own methods (however, during the period of this research GTS have issued the "Development and Project Management Guidelines" to the whole of the organisation in an attempt to streamline the processes used). A number of problems arise from this set up:

- Each of the airport business units manages projects in relative isolation from the rest of the organisation
- Large projects of an airport nature are conducted by GTS at the airports with the airport manager having little control.
- Projects with a large operational impact which may be better managed by the airport business unit are often devolved to GTS to manage.
- Airport project managers lack central coordination.
- GTS release control procedures to the airports in a formal manner, with little cooperation from the airport project managers, leading to resentment.

This selection of effects resulting from the organisation of the project management function presents a solid case for a common approach to airport project management in BAA plc.

In order to maintain a consistent strategic direction and develop to meet the needs of the business it is necessary for the projects conducted at the airports to form part of an overall development strategy. Historically the individual business units have conducted projects independently, symptomatic of the difficulties in achieving coordination and strategic direction across the BAA project portfolio. Therefore, if value is to be achieved through projects, it is necessary to manage a portfolio of projects from within the corporate value system.

►*A model is required to facilitate the strategic management of individual projects implemented throughout the BAA plc organisation.*

As the project commences, value is added through the input and transformation of resources. The construction process combines the input of many participants from both the supplier and customer sides in the formation of a product for the client organisation (BAA plc). The client is the body with sole responsibility for the project and with the most at stake. It is therefore important that the client remains in control of the project and has ultimate control over the processes that occur during the project lifecycle. For

this reason the model is directed at the client and forms a decision making progression from a client perspective.

Common to this philosophy is the view that the airport project presents specific airport issues regarding safety, security and continuous airport operation. For this reason the client must retain ultimate control of the project decisions to ensure that the project itself does not compromise the operational environment within which it is required to take place. The model should collate the necessary information and decisions from the business managers in the most efficient and effective manner. In this way the core business exist in harmony with the development process.

►*A model is required to form a decision making progression from the client perspective.*

The airport project can take many forms and within one airport development there may be a multitude of projects with very different characteristics. A single project may involve civil and building engineering, structural engineering, electronic engineering and mechanical sub projects. The model must reflect the complexities of each of these types of engineering project and be simple enough to adapt to the specific characteristics presented by them. It is necessary therefore for the model developed to be flexible and simple. Compounding the variety of project types within BAA plc is the locational variance found within the sponsoring organisation. The model is destined for use on projects across the organisation; this presents specific problems within the BAA organisation due to the subcultures existing at each of the business units. It is not the intention to curtail these sub cultures but to superimpose a project management subculture binding together the different business units. This is to be achieved through the strategic project management model.

►*A flexible model is required that is suitable for use on any type of project likely to occur within an airport development.*

Thus far it has been suggested that a flexible, systems model is required to manage projects from within the client organisation to add value to the business. Having defined the philosophy on which the model is based, setting up the broad parameters. the next section will expand on the characteristics of the model that will ensure value for money for the project and therefore the business.

7.2 Characteristics required to achieve value for money

BAA's corporate strategy is focused upon the core business, requiring value for money in development projects and achieving customer satisfaction. Ultimately BAA are concerned with increasing their competitive position in pursuit of profit as with any other organisation.

It has been indicated (Porter, 1985) that the key to competitive advantage is understanding the customer requirement. The nature of the airport business places BAA in a position where the customer is non unitary, ie where the customer is a "multi-headed" group of individual customers each with a stake in the output of the airport business. The nature of the project will dictate the specific make up of this customer group, but it is common that they will form a hierarchy of strategic importance for the airport organisation. The airport organisation can define at least eight customers for each of its projects, (section 2.4). These form a hierarchy of importance to the business with priority placed in a different position depending upon the project.

It is necessary therefore for BAA to balance the needs of this customer group and develop it's business to best suit the common customer requirements. In order to increase the value of the business therefore it is necessary for the client to act as a focus for the customer requirements through the project process. The huge number of parties to the construction project process require leadership; this logically comes from the client organisation who has the ultimate stake in the project.

Chapter three indicated that value is fundamentally determined by the customer / user. In the case of the airport where each of the user groups form a complex interrelationship, the identification of value is difficult. It is necessary therefore to actively seek out the conflicting values and form a congruent definition between all facets of the customer group in a structured manner. The work of Norman (1993), discussed in chapter three, stands out as a means of creating a *value system*, whereby

value is not presented to the customer, instead it is actively generated between the customer and the producer. It would therefore seem necessary to involve the customer in the early stages of the value definition within the model and work with the customer group to realise value for money.

►*A model is required that will involve the customer and user groups in the definition and realisation of value for money, by establishing a procedure to optimise the communication links.*

It has been indicated, from the discussion in chapters 4,5 and 6, that achievement of business value is achieved through fulfilment of the customer objectives via the management of project portfolios. The corporate value chain facilitates the analysis of the business objectives and the strategic direction for the project portfolio; the business value chain sets up the project portfolio and is concerned with the integration of individual projects; the project value chain is concerned with integration within the individual projects. The network of corporate value, business value and project value must be achieved through the model of the project process.

►*A model is required to integrate the corporate value, business value (portfolio of projects) and project value objectives by acting as a filter for the corporate objectives.*

The models of the project process presented in chapter 6 consider the project to be an output of the corporate strategic management process. If the model for BAA plc is to integrate the corporate, business and project objectives corporate strategy process and the project process must be fused. This is presented in figure 7.1 showing the breadth of the model, encompassing all three levels of value enhancement. The portfolio of projects exists within the corporate value chain and therefore reflects the value objectives at corporate level. The individual projects that arise from this portfolio are rooted in the corporate objectives. The model for the project process must span the whole of this diagram, tracking the project from its corporate roots to it's realisation through the construction process.

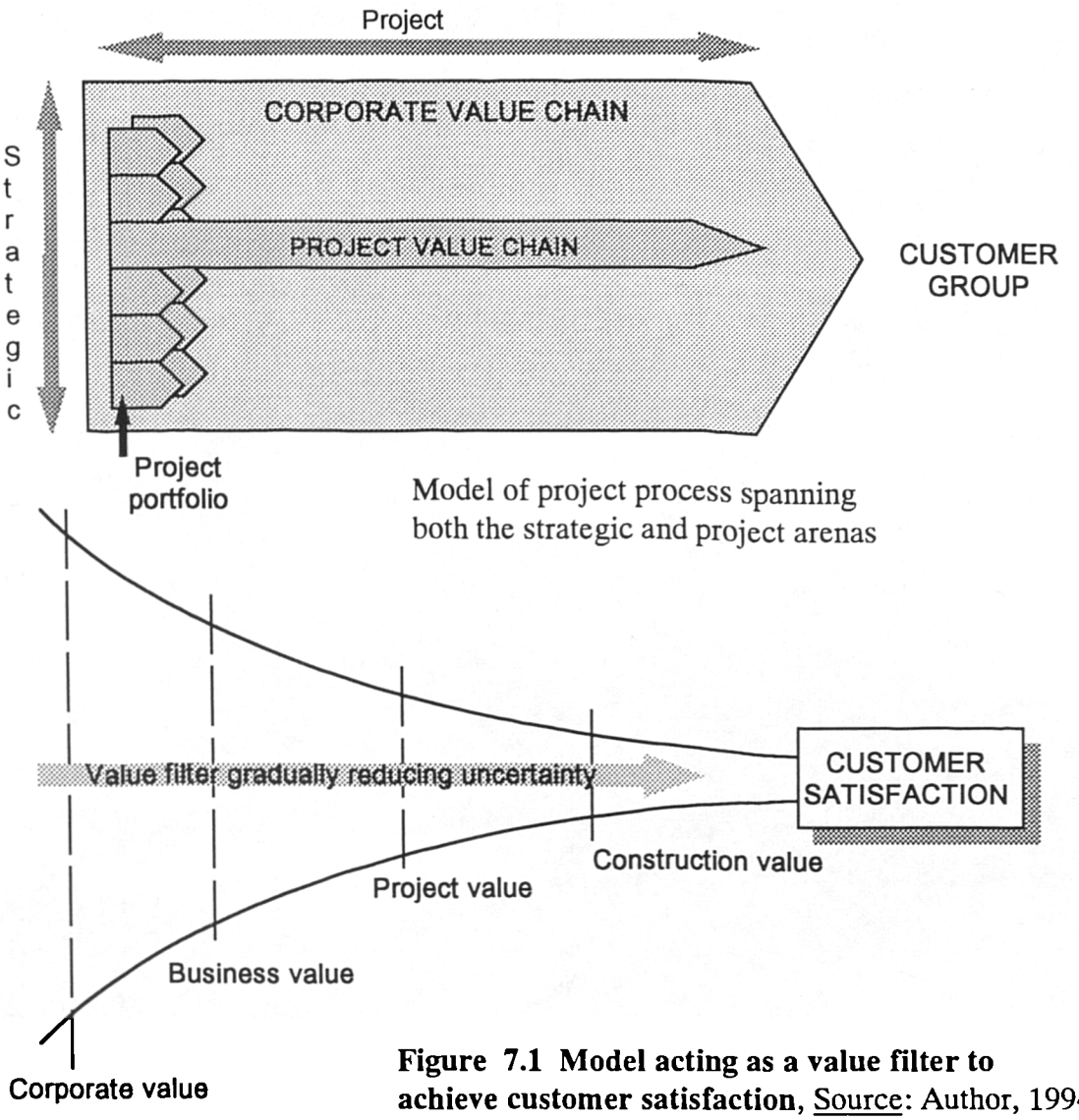


Figure 7.1 Model acting as a value filter to achieve customer satisfaction, Source: Author, 1994

The model should therefore act as a filter for decisions based upon the definition of value established from the strategic analysis of the customer group. A vast array of objectives will be filtered through the strategic management process, to enter the project portfolio management process to be filtered again. Once the project objectives have been established the project will only realise these value objectives through a structured decision making process within the client organisation.

►*A model is required to structure the decision making process to filter the corporate objectives through the project.*

In order to achieve the requirements highlighted so far a preliminary model has been developed to which detail will be added as this chapter progresses.

The overriding issue so far is that the model must address a range of issues from those of a visionary nature to those controlling specific elements of the process. It must address both the management of a portfolio of projects (shown as the vertical aspect in figure 7.1) and the management of individual projects (shown as the horizontal aspect of individual projects in figure 7.1). The nature of the tasks required in the early stages of a project, when it is part of the corporate business plan, vary significantly from the nature of the tasks once the project enters implementation. For this reason the model is split into two interrelated sections: the *strategic* and *tactical* phases. This is confirmed by the work of Pinto and Slevin (1986) who first identified the strategic and tactical delineation. The strategic phase is holistic and visionary in nature whilst the tactical phase is concerned with control, coordination and human resources management.

►*The model combines a strategic phase and a tactical phase in achieving the dual requirements of the project portfolio and the individual projects.*

In this analysis the strategic phase forms the link between the organisation's corporate strategy and the projects planned in order to realise the strategy. It remains problem-oriented by investigating the alternative options for reaching a solution. The client organisation must lead the early stages of the project to ensure that the business need is met in the way achieving best value for the money invested. Chapter four discussed the management of a portfolio of projects to act as a sieve allowing only particular projects to become reality. The strategic phase of the project must facilitate the portfolio management of projects within BAA plc. This presents problems in respect to the structure of the BAA organisation. A central and visionary perspective must be formed without removing the projects from the business unit within which they will take place. Once the strategic phase has consolidated the vision for the future through the planning of the project portfolio the tactical phase must facilitate the completion

of individual projects within the airport environment.

The tactical phase takes the output from the strategic phase and translates it into a built facility to meet the objectives. It is therefore solution oriented, moulding specific parameters around the solution generated from the strategic phase. This phase is concerned with project control in terms of people and technical processes. Reference to figure (7.2) will show the horizontal portfolio of projects from which result the individual projects. The strategic phase can be seen to facilitate the portfolio management of projects and the tactical phase the management of individual projects in fulfilment of the project objectives.

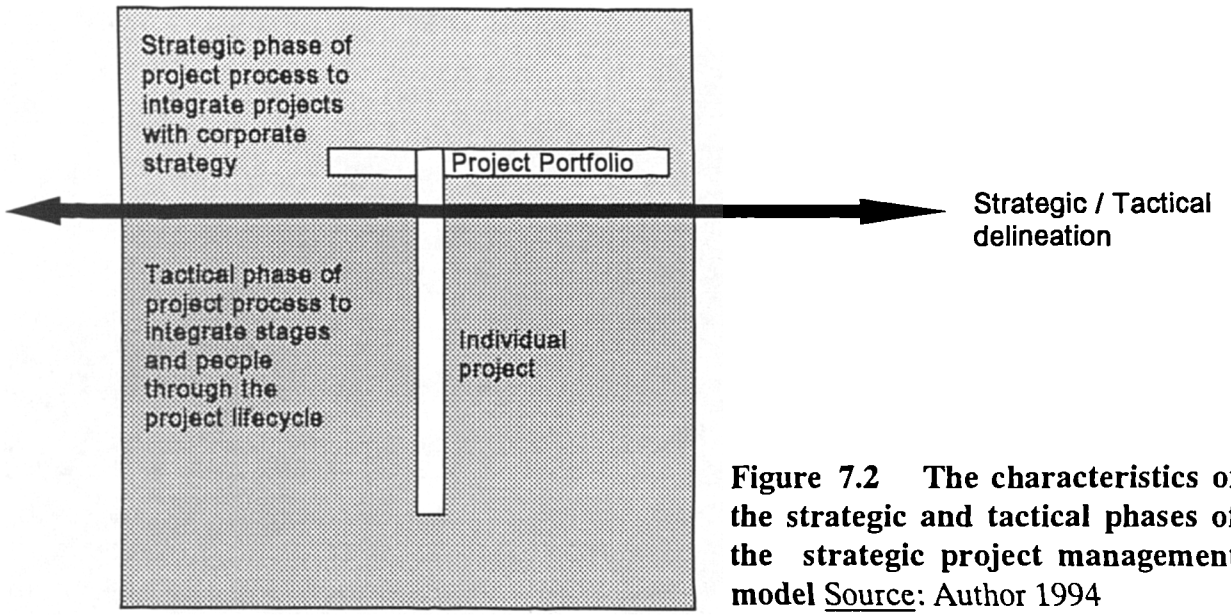


Figure 7.2 The characteristics of the strategic and tactical phases of the strategic project management model Source: Author 1994

The point of demarcation between the strategic and tactical phases marks the shift from problem orientation to solution orientation; the point at which the conceptual solution has been agreed. The outcome of the strategic phase may be a solution not to build; the definition of value when related to the corporate strategy may lead to a decision that a built solution is non optimal. It is only once the tactical phase is entered into that the solution is known and the project begins to develop the specific characteristics of the concept solution. This point has therefore been referred to as the decision to build line, separating the specific solution orientation of the tactical phase from the more conceptual investigation of options in the strategic phase.

►*The strategic and tactical phases are delineated by a "decision to build" line indicating a shift in orientation from problem to solution driven.*

This conceptual "decision to build" line must facilitate the flow and thread of the value message through the project and can therefore not form a boundary to information. On the contrary, the line must actively translate the values and objectives established in the strategic phase into tactical phase.

Since the nature of the tasks above the "decision to build" line are different then also the actors participating in the project vary through the duration of the project. The early decisions will be made within the client organisation, reaching out into the various client stakeholders to understand their objectives and values for the project fitting these with the overall business objectives. This is therefore based within the client value system. Here the culture of BAA will facilitate mutual objectives across each of the client stakeholders, however, there will always be value differentials that must be consolidated into an overall set of project objectives. Below the "decision to build" line the project enters the tactical phase when a large number of varying organisations come together to realise the built facility. It is at this time that the value system no longer sits within the client organisation. Each participating organisation has a different set of values, many of these conflicting, that must be managed the ensure that optimum project value is realised. This "multi value system" requires efforts in communications and leadership in order to consolidate the multiple values existing during the design and construction of the chosen facility.

►*The "decision to build" line marks the distinction between the client value system and the value system of the multiple organisations that come together to produce the built facility.*

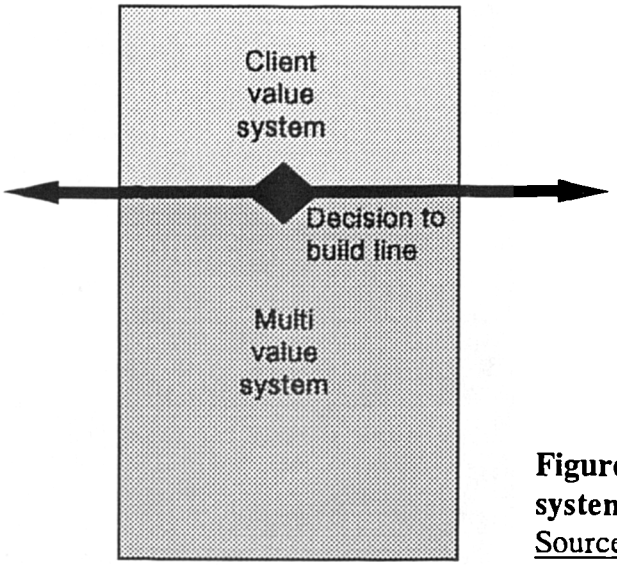


Figure 7.3 The shift in value system across the decision to build line
Source: Author 1994

In summary of section 7.2, the model has been developed to include a demarcation between a strategic and tactical phase to facilitate the fusion of the corporate, business and project objectives. The model has been described as a filter to communicate the flow of value through the project. A point of demarcation has been suggested between the strategic and tactical phases, below which the model must unite the value systems of a multitude of organisations maintaining the value thread. These are all conceptual characteristics creating the boundaries of the project management model. Section 7.3 fills in this framework by defining the stages that occur as the project commences.

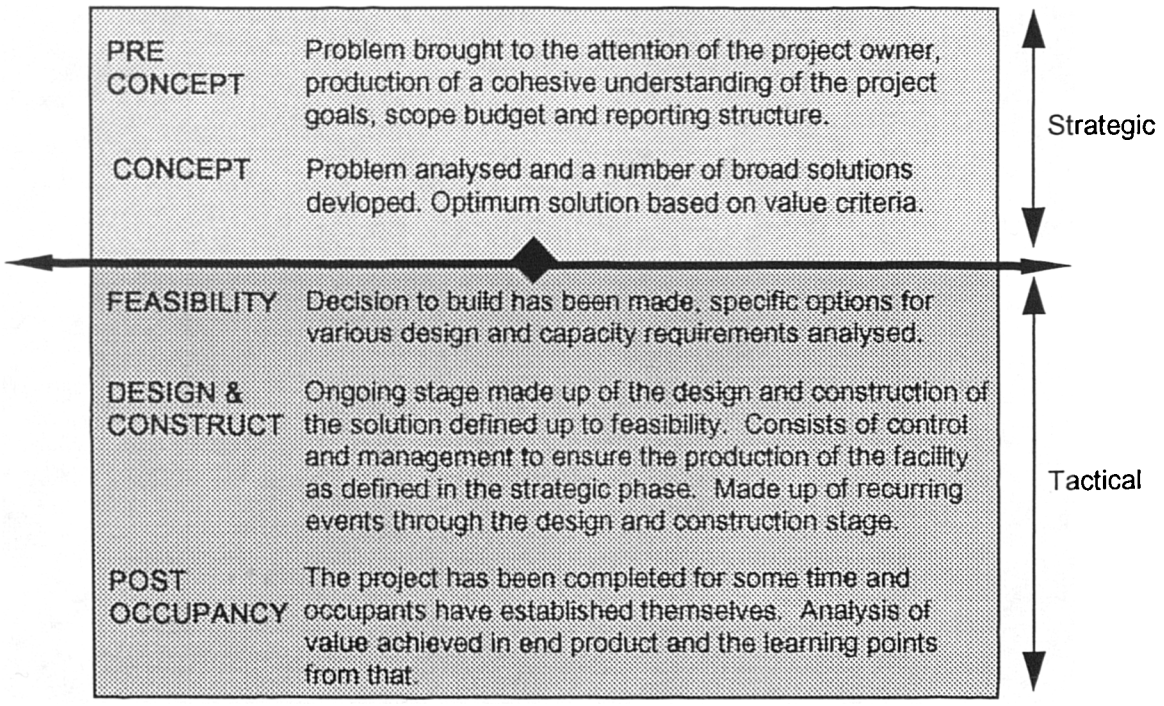
7.3 Interdependence of project stages within the model

Chapter five characterised a project as a series of steps superimposed on the business to achieve a number of preset objectives. These were formed into a project value chain whereby the individual stages linked to add value to the process as the project developed. In order to prescribe the required steps to be taken to secure value for money it is necessary to define a series of stages within the overall *strategic-tactical* framework. The conclusions of the review of existing project management models revealed that the progression should be made up of a series of sequential stages defining a logical decision making progression. It was also concluded that the stages need to be interrelated to ensure a flow of information through the project.

The traditional definition of project stages commences with an idea and progresses through a series of fact finding stages in order to add detail to the original concept. In order to accommodate the strategic phase of the project a front loaded progression of steps has been defined for this model. The stages chosen for the model are shown in figure 7.4 with a brief explanation of their meaning.

The pre concept and concept stages fall into the strategic category since they are concerned with the definition of the project and review of options before the decision to build has been made. The remaining stages make up the tactical phase by adding detail to the solution defined by the strategic phase.

►*The model should be divided into five primary stages: the preconcept and concept falling into the strategic phase, the feasibility, design and construction and post occupancy falling into the tactical phase.*



These project stages were developed from the literature, drawing together the commonly identified stages and those recognised by BAA. The preconcept stage has been added to reflect the enhanced strategic activity.

Figure 7.4 The stages of the project defined Source: Author 1994

Chapter six also highlighted the necessity to achieve communications between these stages and not leave them standing in isolation from one another. It is therefore necessary to create feedback amongst the stages in order to learn within the project. In addition, a primary feedback loop has been defined from the end of the project to the start of other projects in order to fulfil the requirement for organisational learning, to assist organisational development.

►*Feedback loops are defined between the stages and surrounding the overall model to facilitate project and organisational learning.*

Discussion of the value enhancing activities through projects resulted in identification of the management of the product and the management of the process. These flow through the project process and therefore across the length of the model. Examination of the elements highlighted in chapter six leads to definition of the following processes that must be managed through the project stages:

- The management of value
- The management of design
- The management of risk
- The management of procurement
- The management of time, cost and quality
- The management of people

Each of these processes must take place across the stages of the model forming a flow through the stages, optimising both the product and the process links through the project value chain. The stages must interrelate to form the flow of these processes through the model.

►*The model should be arranged to facilitate the processes required to achieve product and process value*

Chapter six highlighted the necessity for a decision making process to assist the client organisation to achieve the required milestones at each stage. In order to maintain simplicity and appear "user friendly" the model has been arranged in the form of action plans highlighting the necessary activities at each stage to conduct the processes down the strategic project management model. The five action plans relate to each one of the five project stages. These action plans present the tasks in simple and concise checklists, such that the project manager can see the outline of the tasks required at different stages of the project.

►*The specific tasks to be conducted during the model are arranged in the form of action plans.*

Figure 7.5 outlines the conclusions so far in the model development. What remains are the actual tasks to be conducted at each stage. The next stage will consolidate the critical success factors highlighted in chapter six with the conclusions from the discussion on achieving value, in order to add the final details to the model.

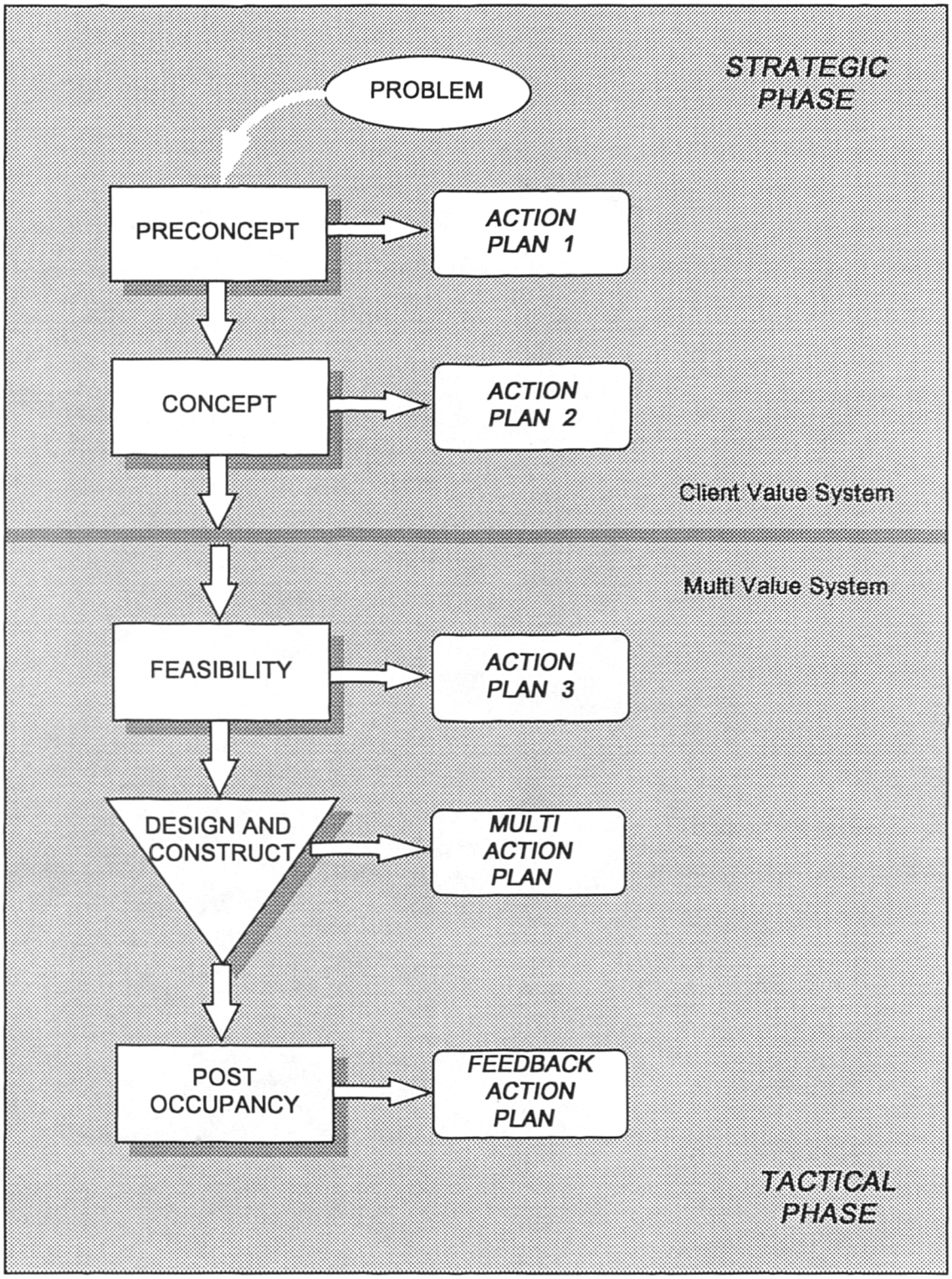


Figure 7.5 The framework of the preliminary model for the strategic management of projects Source: Author 1994

7.4 Tasks within the model to achieve project success

The specific tasks that require attention will be contained within the action plans for each stage. They will form discreet checklists for ease of use. This section will review the required tasks at each of the stages in the strategic project management model separately. Chapter six reviewed the factors critical for project success and placed them within three categories: the strategic, tactical and interface factors. Clearly it is possible to directly relate the strategic critical success factors to the strategic phase of the model and the tactical critical success factors to the tactical phase. The interface critical success factors are concerned with consistency and communication across the project stages and therefore will be present in each of the stages. The critical success factors appearing in the conclusions of chapter six have been reproduced in table 7.1 for ease of reference. The discussion to generate the checklist for each stage of the model will refer to this table.

The subsections will open with a summary of the characteristics of the stage in question, following which a discussion will investigate the required tasks and decisions to achieve the objectives. The subsections will close with a list of the tools and techniques that may be used to facilitate the tasks.

The format flowing through the discussion of the stages in the model will appear as follows:

- Characteristics of the stage in the model
- Objectives of the stage in the model
- A checklist of actions to be conducted at that stage of the project
- A schematic flowchart of the actions identified in the action plan
- A list of tools and techniques for use in the achievement of the actions.

Strategic Critical Success Factors	▸Determine the strategic fit of the project giving the project a sense of mission ▸Define the objectives of the project and its scope with clarity and viability ▸Develop plans for the remainder of the project implementation including choice of management system, pre-selection of bidders, risk management, designing for construction, etc. ▸These factors should be conducted with full support of top management.
Tactical Critical Success Factors	▸Devise suitable control systems to reduce uncertainty and document changes to the project scope and work definition. ▸Select the project team according to their experience and develop a suitable project organisation structure to remain flexible to the demands of the project. ▸Build the team into one with clear direction, strong motivation and learning. ▸Empower the project manager to allow him/her to manage the project through the implementation stages. ▸Provide the project with adequate resources.
Interface Critical Success Factors	▸Establish a formal network of communication between all key actors to define the requirements fully and establish a common understanding of the project goals. ▸Identify the project stakeholders, identifying their influence as positive or negative and establish a plan for the continuous management of communications, conflict and publicity. ▸Manage the internal and external political interface possibly by the use of a project director. ▸Preferred use of contracts to encourage mutual trust and understanding between the owner and contractor, forging the interface between the design and construction phases of the project.

Table 7.1 Critical success factors developed in chapter six

7.4.1 Preconcept stage

Characteristics of the preconcept stage include:

- *The project has arisen as a result of a problem that needs attention*
- *No project organisation has been chosen*

Objectives of the preconcept stage:

To understand the problem and ensure that its definition aligns with the objectives of the corporate strategy. It is hoped that the tasks during this stage will define corporate value and set the context for the project definition. The key actors in any ensuing project will require identification.

In generating action plan 1, a checklist of the tasks required at preconcept stage, the strategic and interface csf's were utilised. It is clear that this stage is simply to set the scene for the remainder of the project and ensure strategic fit. Procurement is highlighted in this stage in order to capture the strategic procurement issues within the portfolio of projects. That is, the issues regarding partnering, standardisation, contractor pre-qualification etc. The checklist therefore becomes:

PRECONCEPT CHECKLIST	Action plan 1
- Define the real problem and hence the real need - Define the corporate value criteria and prioritise - Define success - Fit the project within the corporate strategy - Integrate this problem with other projects in the area - Identify the project organisation based on experience - Identify the project stakeholders and their potential influence - Identify the high level project risks for the business - Investigate the strategic procurement options for inclusion	

This checklist has been schematically represented in figure 7.6 grouping the tasks into three main areas:

- Identification of key project participants
- Integration within the network of other project and the corporate strategy
- Definition of value for the business and success for the project.

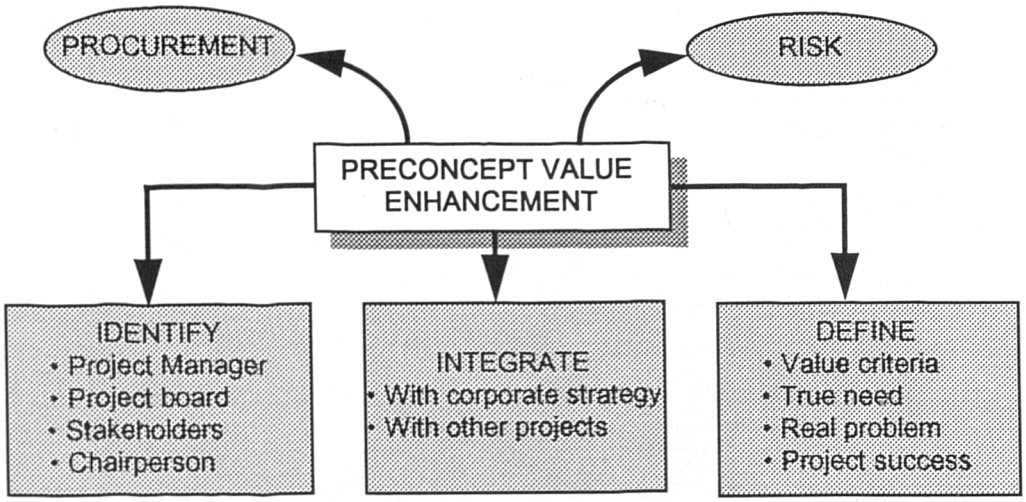


Figure 7.6 Tasks for Preconcept stage action plan 1 Source: Author 1994

In order to achieve this list of actions there are a number of tools and techniques that may be used:

- Brainstorming and prioritising
- Strategic analysis and visionary thinking
- Reference to feedback from past projects
- Analysis of project management resources

7.4.2 Concept stage

Characteristics of the concept stage:

- *Number of broad solutions generated*
- *Preliminary cost estimated from cost database and past projects*
- *A statement of the business value exists*
- *The project has been integrated into a portfolio of projects*

Objectives of the concept stage:

The concept stage specifies the nature of the value criteria for the project and embarks upon a definition of the project scope. A number of options will be

analysed in an attempt to define the nature of the solution ie whether there is a decision to build. In order to maintain the link between business and project value the decision made regarding the solution will be based on the value definition generated from the preconcept stage.

The tasks required therefore at the concept stage of the strategic project management model attempt to refine the business value definition into a definition of value for the project. Also the links across the project organisation must be forged in developing the preliminary briefing document, capturing the needs of each member of the project organisation and key stakeholders. The choice of procurement option should be analysed to develop the project delivery solution most suited to the problem to be addressed. It is necessary during this stage to sufficiently reduce the uncertainty amongst the team to be able to make the *build* decision. The tasks at concept stage therefore become:

CONCEPT CHECKLIST	Action plan 2
- Establish communication with key stakeholders - Define the common value criteria for the project - Analyse options for the solution of the problem - Lifecycle cost each alternative option - Assess each alternative option against the value criteria - Conduct client centred analysis of project function - Choose concept solution - Develop the preliminary statement for the brief - Challenge any existing brief according to the project value criteria - Analyse project risk elements - Analyse procurement options according to the project value criteria and the project risks	

This has been shown schematically in figure 7.7 highlighting the ultimate output from this stage as the decision to build. This marks the point from where the strategic project management model becomes solution oriented. If the decision is made that the problem can be solved by means other than building, the project is managed for example within an operational department. This stage therefore confirms the project solution as a built facility and the remaining stages facilitate translation of the need into a final product.

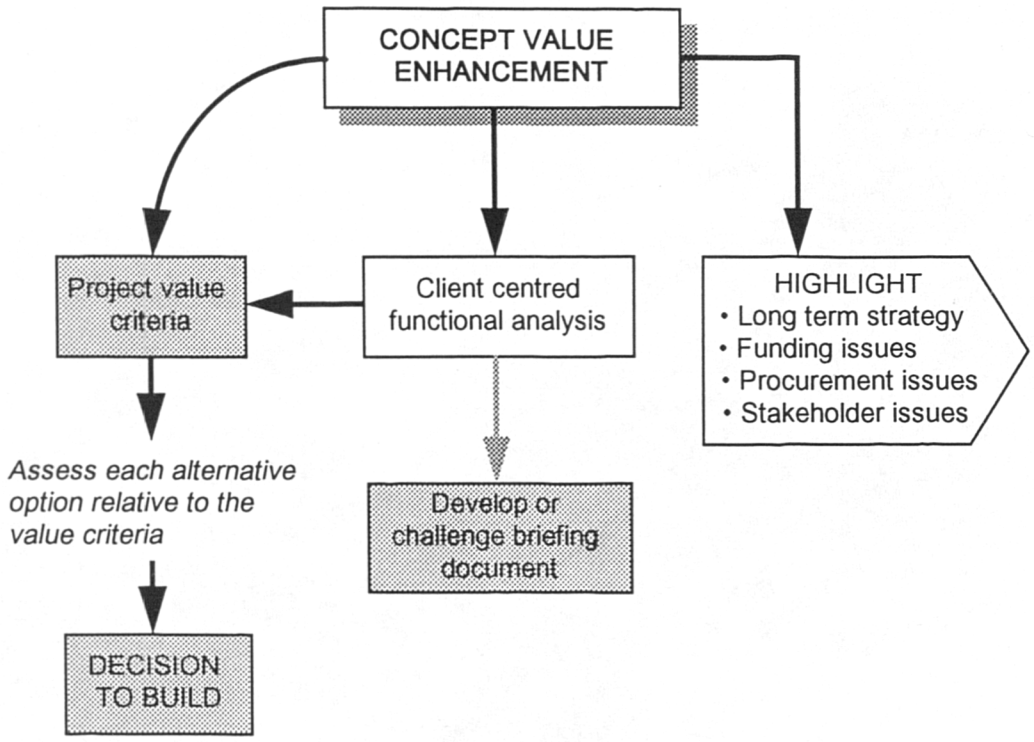


Figure 7.7 Tasks for Concept stage action plan 2 Source: Author 1994

In order to assist in completing the checklist the following tools and techniques may be utilised:

- Logical generation of a process flow chart
- Identification of key organisational activities
- Client / end user based analysis
- Stakeholder management plan
- Life cycle costing of options

- Space planning according to the project targets database
- Translation of process flow chart into a project brief
- Procurement matrix for choice of project delivery method
- Value management exercise.

The combination of the preconcept and concept stages encompass all the critical success factors within the strategic category . Also these first two stages set up the communication flows for the project ensuring that the key persons with a stake in the project are involved in defining the project need and the development of the brief. The tasks within the preconcept and concept stage action plans establish the interface links to be utilised during the implementation of the project.

The next three stages in the model fall into the tactical category and are concerned with controlling and managing the project process in order to fulfil the value criteria and achieve project success as perceived by the project users, client and stakeholders.

7.4.3 Feasibility stage

Characteristics of the feasibility stage:

- *Decision to build has been made*
- *The concept of the solution in terms of broad space planning exists*
- *A broad outline life cycle cost exists for the option chosen*
- *Cost broken down into broad estimates within the options*
- *The project board, project manager and stakeholders have been identified and the communication between them defined.*

Objectives of the feasibility stage:

This stage essentially tests the feasibility of the chosen option under a number of design and capacity parameters allowing the project organisation to choose the final option best capable of meeting the project value criteria. The brief is finalised in preparation for the design stage of the project.

At this stage the project reaches a new dimension, leaving the sole analysis of the client project organisation to enter the value system of a multitude of participants and organisations to the ensuing design and construction process. It therefore becomes increasingly important to continue the thread of value through the project via communication and control. The checklist for this stage is based upon the tactical critical success factors and continues the interface critical success factors. The checklist for the feasibility stage becomes:

FEASIBILITY CHECKLIST	Action plan 3
- Prepare options for the project concept - Assess options relative to the project value criteria - Select the project option corresponding most closely to the project value criteria - Conduct a need-cost* analysis highlighting areas of poor value - Reassess the client needs based on the need-cost analysis - Refine the brief to incorporate the final design parameters - Ensure ownership of the chosen solution by signing off the brief - Conduct risk analysis on elements identified as potentially high risk	

* The need cost analysis assesses the relative costs of the customer requirements such that priorities and perceived needs can be reassessed for value for money.

This has been schematically represented in figure 7.8 highlighting the main output of this stage as a feasible option combining the value criteria of the project organisation and stakeholders. It is important at this stage to complete the brief iterations and ensure all interested parties are aware of the contents of the project brief.

In order to assist in the feasibility stage the following tools and techniques may be used:

- Comparative analysis of value criteria, brief and design options
- Whole life costing
- Stakeholder communications plan
- Cost breakdown and allocation to value criteria in cost/need matrix
- Reassessment of value criteria priorities
- Manual or computer simulation
- Elemental risk analysis.

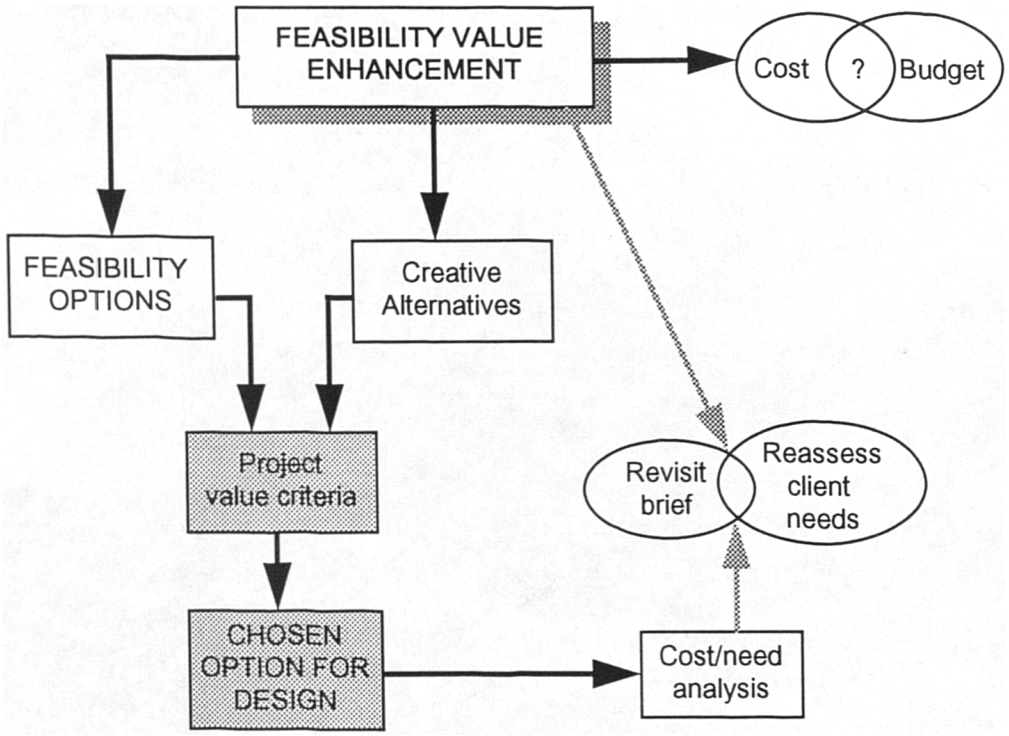


Figure 7.8 Tasks for Feasibility stage action plan 3
Source: Author 1994

At the end of the feasibility stage all options for the project should have been investigated and the information available to the project team should detail the client requirements fully. From this stage the project is focused upon the design option chosen, developing a design based upon the design parameters and constraints established during the feasibility stage. The next part of the project is generally the longest in duration, encompassing the design and construction of the chosen facility.

7.4.4 Design and construction stage

Characteristics of the design and construction stage:

- *Focused upon the option selected from the previous stages*
- *Many participants arrive and depart from the project team over the duration of this stage*
- *The clients needs are interpreted by many extraneous designers/constructors*
- *Many of the activities in this stage will interface with other activities*
- *Many of the activities will recur during the duration of the design and construction period*

Objectives of the design and construction stage:

It is the objective of this stage to proactively manage the design and construction process within schedule, within the predetermined cost estimate and to the quality required by the client. This entails interfacing the design and cost management process to inject the clients perception of value; to interface the design and construction activities such that the product is designed in empathy to the method by which it must be constructed; and to interface the many designers and contractors such that they work as a team toward fulfilment of the project objectives.

The design and construction stage is thus made up of two primary activities. These are the tactical management and control of the facility design and construction and secondly the management of the interfaces between both the activities and the organisations responsible for them. This requires continuous recurring monitoring of performance and progress by the project team. The tactical critical success factors indicated in table 7.1 identify The tasks required during the fourth stage in the strategic project management model are:

DESIGN AND CONSTRUCTION CHECKLIST	Action plan 4
- Coordinate and integrate client strategic initiatives (LCC, project targets, cost modelling, design optimisation, contract development) - Prequalification of designers and contractors allowing selection of team to suit project - Develop cost estimates with design team - Develop design schedule with the design team highlighting specific design interfaces and significant dates - Comparative cost analysis as the design develops - Identify cost savings and areas of low value through value engineering exercises - Conduct regular constructibility reviews with designers regarding materials, methods and resources - Develop productivity targets with contractors - Encourage a team spirit between all members of the project organisation, increasing ownership and motivation - Communicate the "value system" to each new member to the design or construction team, maybe through an induction process - Plan information and data to be collected for feedback and learning	

The activities required during this stage are outlined in figure 7.9. It can be seen that this diagram includes "Gatekeeper" as the coordinator between the design and construction control. This suggests the possible enhancement to the role of the quantity surveyor, whereby he/she takes the role of a cost manager with experience of the design process, who can work with the design specialists to enhance the value of the final product. The gatekeeper fuses the management of cost and design, leading to proactive, rather than reactive, cost management.

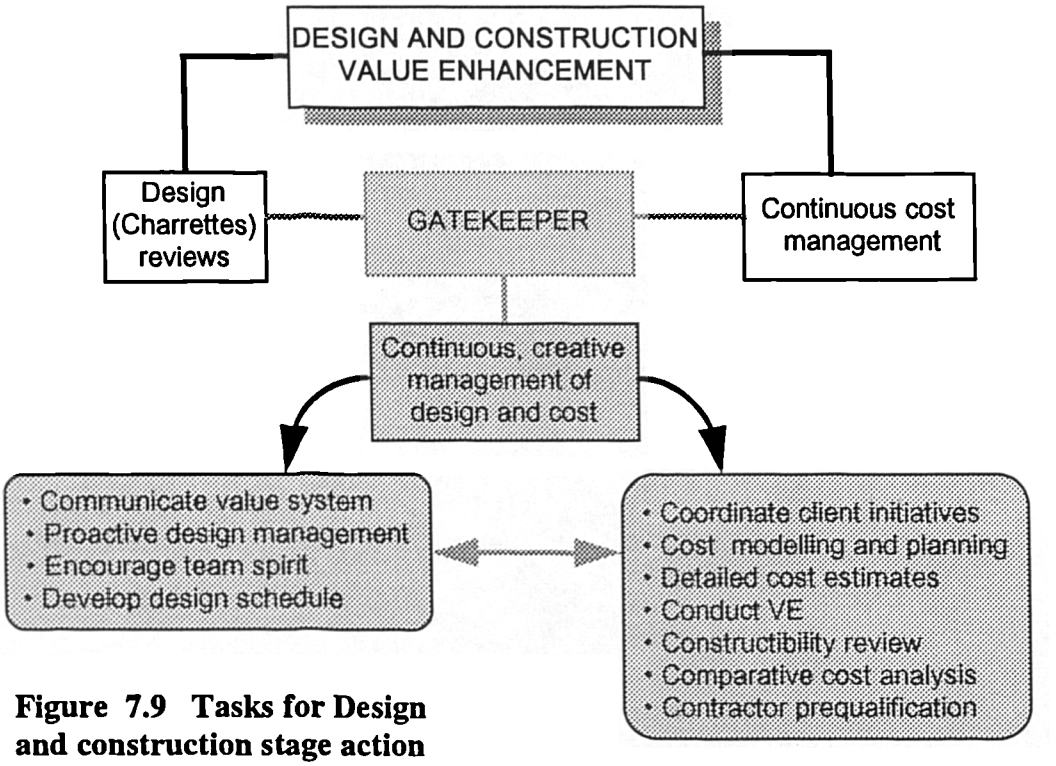


Figure 7.9 Tasks for Design and construction stage action plan 4 Source: Author 1994

In order to assist in the achievement of this complex stage consisting of a variety of interdependent activities the following tools and techniques may be utilised:

- Informal and formal meetings to generate full communications
- Comparative cost matrix of detail design elements
- Communication of project targets
- Site and off site value engineering
- Generation of creative alternative technical solutions
-Materials assessment for availability, continuity and buildability
- Productivity benchmarks and milestones from cash flow forecast
- Set up induction course for new members communicating project goals
- Regular cost and progress documentation
- Change management plan and proforma

The end of this stage marks completion of construction, when handover takes place to the users of the facility. Only at this point can the functionality and suitability of the project be truly assessed. It is therefore important to continue the project into the occupation period such that the full learning experience can take place. The brief documentation, space planning, quality of the finishes, functionality, environmental conditions can be assessed during the period after handover and commissioning. The final stage in the strategic management model is therefore the post occupancy stage.

7.4.5 Post Occupancy stage

Characteristics of the post occupancy stage include:

- *Project has been handed over to the user*
- *User has occupied the building and settled once the project snagging is complete*
- *Suitable observations have been made during the project to generate data for feedback*

Objectives of the post occupancy stage:

The post occupancy stage is primarily about gathering information to feed back into the organisations involved in the project process, thus promoting development of the project process.

The post occupancy stage should review both post project issues and post occupancy issues. The first category is concerned with project management performance, for example, schedule and cost control, the success of risk management, success of procurement choice. The post occupancy data reviews the original definition of value, the degree to which the brief has been met, perceptions of the finished product. The checklist for the final stage of the model is therefore:

POST OCCUPANCY CHECKLIST	Action plan 5
- Gather technical data regarding the project schedule, cost and quality - Post project assessment of the procurement route, change management, risk management, value management - Involve project organisation in post project assessment - Gather subjective data from end user feedback - Observation of use of facility to test the original brief requests - Assess and report project management lessons - Assess and report customer satisfaction and value for money - Plan implementation of feedback to develop the project management process and practice.	

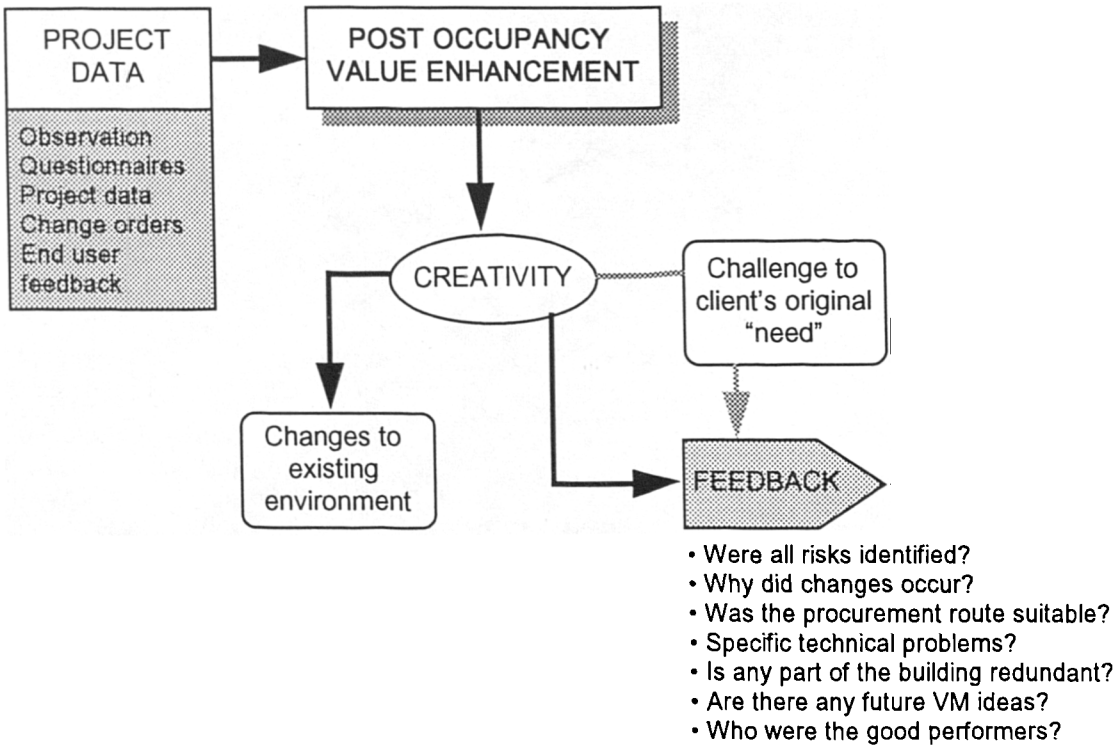


Figure 7.10 Tasks for Post Occupancy stage action plan 5 Source: Author 1994

Figure 7.10 schematically represents this stage indicating that creative thought and review are the main characteristics of the tasks required during this stage. This indicates that the post occupancy stage can result in changes to the environment as well as recommend changes to the way in which future projects are managed. This is a powerful stage that closes the feedback loop on the project process. It is only once this stage is concluded, by implementing changes resulting from the feedback, that the project is completed.

The tools and techniques that may be used for this stage are many depending upon the size and sensitivity of the project. Not all projects will require post occupancy reviews but all will require post project reviews. The following tools and techniques are a selection of those that may be utilised to assist in the review process:

- Collate project information from cost and schedule reports
- Open discussion with project team, contractors and designers to uncover project interface difficulties
- Assess running costs of primary plant
- Questionnaire to end user, observation of use of facility once in occupancy period
- Comparative review of brief
- Creative and challenging discussion of clients original "needs".

In summary therefore, section 7.4 has presented the characteristics, objectives and action plan for each of the stages in the strategic project management model. The tools and techniques suitable for achieving the objectives of each stage are also listed. The model is presented as a combination of the framework diagram (figure 7.5), the checklist for each stage and the flow chart for each stage (figures 7.6 to 7.10).

7.5 Summary

This chapter has followed the development of a model for the strategic management of projects, drawing upon the conclusions of the previous chapters. The discussion established a framework for the model within which characteristics were implanted to gradually develop a model of the critical factors to achieve success for a construction project. The model characteristics were highlighted as the discussion progressed, these are repeated below. The model is required to:

- Manage the major projects process to add value to the business.
- Remain open to environmental influence and communication.
- Facilitate the strategic management of individual projects implemented throughout the BAA plc organisation.
- Form a decision making progression from the client perspective.
- Be flexible and suitable for use on any type of project likely to occur within an airport development.
- Involve the customer and user groups in the definition and realisation of value for money, by establishing a procedure to optimise the communication links.
- Integrate the corporate value, business value and project value objectives by acting as a filter for the corporate objectives.
- Structure the decision making process to filter the corporate objectives through the project portfolio and through individual projects.

Having established the framework for a model, a preliminary model was developed sequentially exhibiting the following features:

- It combines a strategic phase and a tactical phase in achieving the dual requirements of the project portfolio and the individual projects.
- The strategic and tactical phases are delineated by a "decision to build" line indicating a shift in orientation from problem to solution driven.

- The "decision to build" line marks the distinction between the client value system and the value system of the multiple organisations that come together to produce the built facility.
- It is divided into five primary stages: the preconcept and concept falling into the strategic phase, the feasibility, design and construction and post occupancy falling into the tactical phase.
- Feedback loops are defined between the stages and surrounding the overall model to facilitate project and organisational learning.
- The model is arranged to facilitate the processes required to achieve product and process value.
- The specific tasks to be conducted during the model are arranged in the form of action plans.

Having established the framework of the preliminary model, the chapter continued to create an action plan for each of the five stages of the model. The action plans were arranged in the form of checklists for the project manager, such that the critical factors for success could be seen as a list of actions. The action plans were developed by combining the common critical success factors identified in chapter six with the results from the pilot study. The checklists appearing in this model draw together the variety previous studies to reflect common themes. To accompany these action plans a flowchart was drawn to schematically represent the activities required at each stage.

The strategic project management model is formed from a combination of items:

- The overall framework diagram
- The action plan for each stage
- The flowchart of activities for each stage
- The list of tools and techniques for each action plan.

Therefore the model formed marries the characteristics to achieve value through the project process with the factors found to be critical to success. The natural split of the model into strategic and tactical phases facilitated the direct translation of the strategic

and tactical critical success factors. The interface critical success factors formed a continual flow through the model. The completed model thus represent a model for the successful strategic management of projects from the client's perspective.

It is vital that this model is directly related to the practical project and is user friendly. In order to test the model for it's degree of use and accuracy, it is suggested that it must be tested within the project management environment, by managers responsible for achieving success on projects within a variety of situations. Chapter eight describes the chosen research methodology, ie the way in which this model will be tested within the project management environment. The test should facilitate further development of the model to reflect the reality of project management within a highly visible, corporate organisation undertaking a vast construction program.

8 INTRODUCTION

Having argued the need to develop a research model of the strategic project management process a method must be defined for collecting the appropriate data, analysing that data in order to create a model to reflect the research objectives. Due to the complexity of the research material and the interdependence of issues within the subject area, it was considered necessary to undertake a detailed exploration of the available research methods.

This chapter will review the theory concerning techniques for collecting and analysing data to ensure the results are valid and reflect the situation realistically. The way in which the population is sampled will reflect the validity and accuracy of the results and will be dependent upon the characteristics of the data and the organisation within which the research is taking place.

Research may be categorised into two distinctive types: qualitative and quantitative. The former describes analysis of complex, descriptive data in which the researcher may increase his/her involvement and probe to seek more information from the participant. Alternatively, quantitative analysis has the advantage of higher construct and internal validity; the experiment may be repeated with similar results experienced. The data is generally analysed statistically and clear statements may be made concerning causal and interdependent relationships between variables. The discussion will focus on qualitative data analysis, due to the nature of the data collected during this research project. Qualitative data may be collected by a number of means from surveying from outside an organisation to observation within an organisation; the researcher may take an independent look at an organisation or embark on a joint collaboration. The choice of research design will be contingent upon the context within which the research resides.

An alternative research design will be described in which the researcher becomes involved in a collaboration with the client organisation to introduce change through the research programme. This methodology, known as action research, may take a number of forms and presents the researcher with a variety of data collection and analysis methods. Finally

the theoretical discussion will argue the need for an interaction of various modes of research in order to reflect the complex, adaptive organisational setting within which it is required to take place. A new paradigm in research methods using an holistic, interactive approach is described. This combines a number of data collection methods with the action research methodology to form a cyclical process enhancing the validity of the qualitative data.

The chapter concludes with a description of the research methods employed for this particular study based on the conclusions of the literature review. That is, that a variety of data collection methods were used during a collaborative exercise with the client organisation with which the researcher was affiliated. The requirement for change by the introduction of a model of an existing organisational process lead to the use of action research whereby the researcher interjected change into the organisation, feeding back the outcome due to this action to iteratively refine the research model. The organisation was supportive of this methodology, becoming actively involved in the research and therefore adding their input to the research conclusions.

8.1 Research design

In designing a research methodology it is necessary to identify the aims of the research project and the required format of the conclusions. The first stage of the research design is to delineate the problem (Gill and Johnson, 1991). This research project has been commissioned by a private organisation seeking *to develop a model of the project management process in order to improve the value of their construction projects*. The nature of the research methods employed should reflect these aims by careful analysis of the following elements of research theory:

- Theory and data
- Sampling the population
- Design of data collection method
- Data analysis techniques

Each of these areas will be individually discussed in the context of the research project in question., in order to devise an appropriate research method.

8.1.1 Theory and data

Concepts do not occur in a vacuum, they are part of representations of reality, or parts of models or theories. The aim of a model or theory is to simplify reality, allowing a number interrelated variables to be mapped together showing their overall effect (Martin, 1991). The nature of this model is dependent upon the nature of the data being modelled. A broad split can be made into quantitative and qualitative research data, the former labelled as the traditional approach to research (Gill and Johnson, 1991). This is due to the positivist tradition of searching for causal relationships and empirically testing explanatory theories (Walker, 1985), into which the deductive quantitative methods fit. The fact that qualitative research relies on inductive reasoning leads to an uneasy fit with this positivist ideology. This gap has been reduced by the creation of causal explanations of social actions.

Quantitative methods of research analysis rely on measuring variables by experimental techniques resulting in structured, concise and explicit data. The main forms of quantitative data collection are survey methods, laboratory experiment and educational testing. These rely on the researcher creating laboratory conditions in which to conduct the research, such that it can be repeated. Experimental research design allows the researcher to control which units are exposed to which conditions. Having spent the time to set up precise conditions and structure the experiment to record the level of information required, the analysis is conducted by statistical testing. The outcome of these quantitative techniques is usually in the form of causal relationships between variables.

The benefits of construct and internal validity gained by the quantitative approach is highly suited for testing of large populations where one can sample to represent the whole population. However, when the information required is of a non quantifiable nature these benefits are reduced. In the case of qualitative data analysis, experimental research is unsuitable as very often the researcher must record the events as they occur in reality. Experimental techniques are considered to be prone to bias (Gill and Johnson, 1991). This bias is generally due to changes

affecting the members of the experimental group; due to changes in the measurement process and due to the subject's reaction to the processes and context of the experiment. As a result of these weaknesses researchers have tried to take the experiment out into the field to avoid the artificiality of the laboratory conditions. This has lead to the development of less structured data collection resulting in qualitative data.

Qualitative research methods are generally testing for the existence of variables rather than their frequency (Walker, 1985). Typically qualitative methods yield large volumes of rich data obtained from a limited number of individuals. Compared to quantitative techniques the researchers collecting qualitative data "*exploit the context of data gathering to enhance the value of the data*" (Walker, 1985: p3). When testing the processes within an organisation it is often the case that the researcher must investigate the nature of interaction and observe the processes as they are taking place. The results from this type of data collection will be personal and will therefore require interpretive, creative analysis. It is for this reason that concerns exist over the validity of qualitative research, referred to as having low internal validity, low reliability and low population validity (Open University, 1979). Fassnacht (1982) disagrees in stating that field research is no less internally valid than any other method of research.

It is argued that the method is "*impressionistic*" (Allan, 1991). A central tenet of qualitative research is the attempt to keep an open mind and to foster new lines of enquiry. This expression of naivety leads to "messy" research in the absence of clear paths that quantitative methods tread. This can be reduced by making the research as systematic as possible.

Allan also argues that qualitative methods are non verifiable. In order to verify the data the circumstances should be capable of being repeated by others so the outcomes may be confirmed. The difficulty with the qualitative methods is due to their flexibility. The fact that the researcher can develop themes as they emerge

without being held to a rigid formula means that the likelihood of replicating the data collection method is minimal.

In discussing the uses of quantitative and qualitative methods, Walker (1985) distinguishes three phases of research: preliminary, principal and validation. He suggests that the two methods may be used to complement each other across these phases; that early qualitative studies may spark quantitative research at a later stage. The choice of qualitative techniques as the main approach during the principal phase of the research depends upon the topic under study. It may be suited to topics that are complicated or sensitive; concerned with relationships or interaction; or with processes of change (Walker, 1985), also if the research population is small. It may also be the objective of the research to seek thinking from the research subjects.

The characteristics of this research project lead toward the use of qualitative methods for the following reasons:

- The project management process relies on communication, interaction and relationships. These are the areas for investigation.
- Comparison of techniques and systems between business units and other organisations will rely to a degree on perception.
- The research is taking place within an organisation undergoing change
- The research objective is to introduce change into the process of construction project management
- In order to gain support from within the organisation, participation from the subjects will be encouraged in order to gradually introduce the required changes.

This research project is identifying variables, seeking interdependencies and building up theory; the data that will be collected for this process will be inherently qualitative. Therefore it is possible to focus upon the methods to collect qualitative method of data. Having defined the nature of the data it is necessary to identify the persons from whom the data will be collected, this is termed the sample.

8.1.2 Sampling the population

The second area of research theory to be considered is the choice of subjects. The aim of sampling is to select a group of subjects typical of the population to which they belong. A sample is described as *a portion of the units/elements in a population* (Dane, 1990). Sampling methods vary according to the population in question and the objectives of the study. Two main categories can be identified: Probability sampling and non probability sampling (Dane, 1990; Open University, 1972; Cohen, 1988).

Probability sampling includes any technique that ensures a random sample. Quantitative research makes use of *random sampling* wherein every member of the population has an equal chance of selection. From this sample errors can be estimated and the deviation from the result expressed statistically, however it is only suitable for large populations where a random sample may represent the total population. A variation of simple random sampling is *stratified random sampling* using random selection for each subgroup in the sampling frame, where the sampling frame is the available population. Cluster sampling selects from natural and representative groups (Cohen, 1988), for example a town or subgroups of organisations.

The second type of sampling, **non probability sampling**, includes methods whereby the research subjects are chosen for specific attributes rather than from a random selection. *Quota sampling* whereby the researcher selects elements on the basis of categories assumed to exist within the population; *judgement sampling* chooses samples as they are believed to be representative of the sample. *Accidental sampling* relies on self selection, normally based on availability or ease of inclusion.

The latter of these sampling methods are termed purposive procedures as they are directed toward obtaining a certain type of element (Dane, 1990). Sample design in qualitative research is usually purposive (Walker, 1985). Rather than taking a random cross section of the population to be studied, *"small numbers of people with*

specific characteristics, behaviour or experience are selected to facilitate broad comparisons between certain groups that the researcher thinks likely to be important" (Walker, 1985: p30).

When sampling for group discussions, two alternative approaches may be used. An homogeneous group can be selected to increase the chances of full participation without particular members feeling threatened or inhibited. Alternatively it may be advantageous to bring together people whose views are likely to diverge markedly. Again this will depend upon the objectives of the research.

Due to the qualitative nature of the data and the type of analysis anticipated, the benefits of probability sampling are reduced. In order to sample the population to optimise the quality of data collection, non probability sampling will be the primary sampling method. However, wherever possible, that is where there is a large population from which to select, stratified random sampling will be used.

8.1.3 Design of data collection method

Having selected the sample from which to gather data it is necessary to optimise the data collection by using an appropriate research method. Research is a process through which questions are asked and answered systematically, it can take a number of forms described by Dane (1990) as: exploration, prediction, explanation and action. Exploration attempts to determine whether a particular phenomenon exists; prediction examines the relationship between two variables so that educated guesses can be made about one by knowing of the other; explanation determines whether or not two variables cause each other and finally action involves using research to attempt to solve a social problem.

The chosen method is dependent upon the above categorisation and the nature of the data for collection. The discussion will focus on qualitative research methods which include survey research, ethnography, action research as well as a combination of all these techniques within an interactive strategy. Gill and Johnson (1991) place

these within a matrix as seen in figure 8.1. The main research strategies are located within a matrix, describing their interrelation and the different aspects they attempt to fulfil. Gill and Johnson use this matrix to assist the researcher in choice of the appropriate method to obtain their information. Thus in this analogy, the experimental researcher is concerned primarily with precision, the survey methodologist with generality, the ethnographer with the character of the particular context and the action researcher with issues of utilisation. The attributes of these methods with be discussed by considering the data collection methods held within each category.

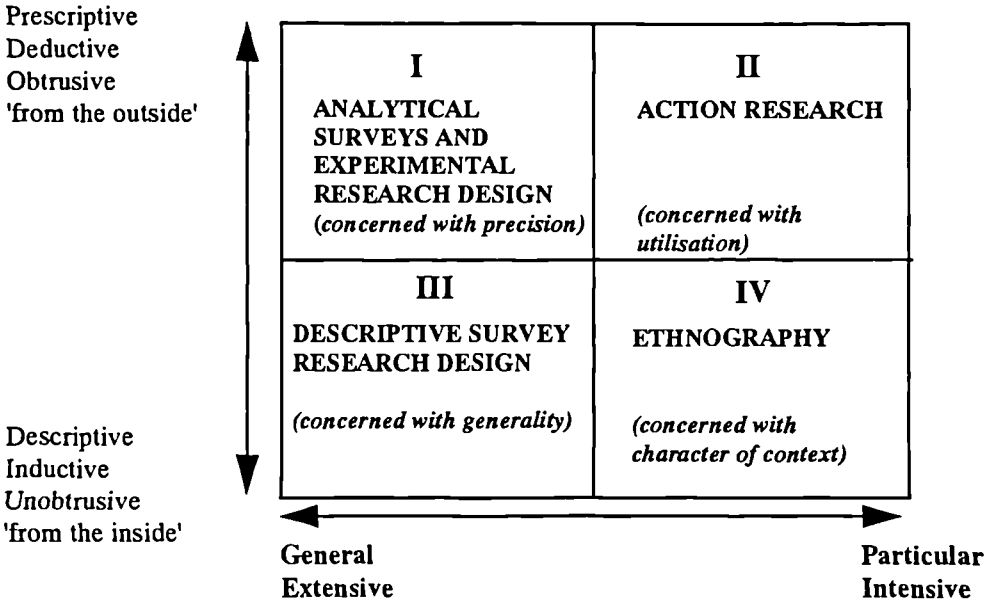


Figure 8.1 Analytical table of research strategies,
Source: **Gill and Johnson**, *Research Methods for managers*, Paul Chapman publ, 1991, p146.

8.1.3.1 Survey research methods

The survey research may take the form of a questionnaire, administered either by interview or as a respondent completed form. These each have their place and the chosen method should be considered carefully to minimise bias. Glastonbury and Mackean (1991) offer a rule of thumb for deciding the most beneficial survey

research method. They suggest that if the researcher is more interested in the depth and quality of data than in having a large number of responses then the interviewing technique should be considered. If the questions are fairly easy to answer and a large number of responses are required to complete statistical analysis then self completed questionnaires may be more suitable. It is clear therefore that survey research may be used for either quantitative or qualitative research. These may be categorised into analytical and descriptive surveys, the latter of interest to the qualitative researcher, is discussed in more detail below.

Descriptive surveys are concerned primarily with addressing particular characteristics of a specific population of subjects, either at a fixed point in time or at varying times for comparative purposes. The most basic decision to be made is how the questionnaire will be administered depending on the information required. This may be by sending a questionnaire which the respondent self administers or the use of an interviewer to administer the questionnaire. "*...Interview is the opportunity for the researcher to probe deeply to uncover new clues, open up new dimensions of a problem and to secure vivid, accurate inclusive accounts that are based on personal experience* (Burgess 1982 in Easterby Smith, 1991: p71). In either of these case the questions must be designed to reduce the effects of bias and to guide the respondent through the questionnaire in order to gain the maximum level of information. Questionnaire design should be planned in outline and then worded and phrased to optimise the return data (Open University, 1979; Cohen, 1988; Gill and Johnson, 1991).

Advantages of interviewing compared to using questionnaires (Open University, 1979; Easterby Smith, 1991) can be identified:

- Interviews are appropriate when questions are open ended
- Interviews have better response rates
- Interviewers can give a better explanation of the purpose of the study than a covering letter to a questionnaire
- On the spot assessments can be made

In addition to this interviews allow the researcher a number of alternatives to uncovering information. It is pertinent to suggest that as much can be learnt from what is left unsaid as what is said; the interviewer can make observational notes during the interview as to the way in which the candidate responds and the setting of the interview; the interview allows probing for further information on a particular subject; the language and jargon the candidate uses .

However, the interview technique has a number of disadvantages compared to the use of questionnaires:

- It is more expensive to conduct interviews than to send out a large batch of questionnaires
- It takes more time to conduct and analyse information by interview
- The propensity for bias is much higher when interviewing due to:

Respondent bias- Inconsistencies in measured attributes
Antagonism to a particular interviewer
Antagonism to being interviewed

Interviewer bias- Appearance and manner, voice tone and delivery
Interviewers own attitudes
Interviewers expectation of the respondents
Interviewers sex, age, position etc.
On the spot coding
Inconsistent use of probing

Situational bias- Place of interview ie the directors office gives a different perspective than the canteen

It may be necessary for the interviewer to conduct group interviews where they act as both initiator and facilitator during the "steered conversation" (Easterby Smith et al, 1991). The interviewer must facilitate a comprehensive exchange of views in which all participants are able to speak their minds and respond to the ideas of others. Group interviewing is considered appropriate where social context is important, when understanding and insight are required and when the objective is to generate new ideas.

8.1.3.2 Ethnography

Ethnography is based upon "naturalist" modes of inquiry, such as participant observation, within a predominantly inductivist framework. Induction is described by Gill and Johnson as general inferences induced from particular instances, or the development of theory from the observation of empirical reality. The first ethnographic studies were conducted by Charles Booth in the 19th century in which he used statistical data, interviewing and systematic participant observation. It was not until the 1950's that ethnography developed into the sphere of management studies (Gouldner 1954).

Ethnography focuses on the manner in which people interact and collaborate in observable and regular ways. Ethnographers generally place more emphasis on observation and semi structured interviewing than on documentary data. It is not possible to define ethnography as a single mode of collecting information since it usually entails the varying application of many techniques so as to elucidate the subjective basis of the behaviour of people. Ethnographers attempt to understand the culture of the situation and so interpret it in the way that its members do without conducting experiments or interviews in artificial environments. The problem of understanding social action lay in the fact that it is a world of interpretations and meanings. There are always multiple perspectives, one must look beyond the official versions of the information given by the participants (Open University, 1979).

Participant and non participant observation

Allan (1991) describes participant observation as the explanation of ethnography. Gill and Johnson (1991) explain participant observation as the observer immersing completely into a social setting and adopting a role of full participation in the everyday lives of the subjects. In contrast to this they describe non participant observation when the observer takes the role as a spectator only observing events and processes and thereby avoids becoming involved in interactions with the subjects.

The former method of observation allows the ethnographer to feel the effects of what is happening as well as observing them. It may be the only viable way of discovering what is actually happening. Non participant observation on the other hand relies on the honesty of the subjects.

However participant observation may immerse the researcher into the culture and render him/her unable to take a dispassionate view of events. The non participant observer may experience the opposite effect by judging the events from within his/her own culture. However the spectator role may be more realistic as the subjects are not affected in any way by the observer. The observer can be presented in a spectrum of roles passing from *comparative involvement* using subjectivity and sympathy to *comparative detachment* using objectivity and empathy. Figure 8.2 sets out the spectrum of participant and non participant observation.

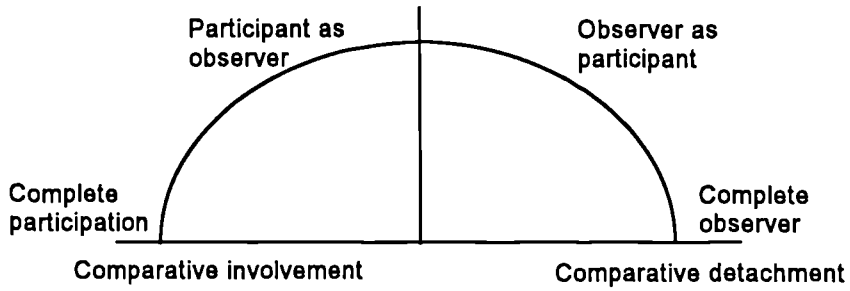


Figure 8.2 The spectrum of participant and non participant observation
Source: **Open University,** *Research methods in Education and Social Sciences, Block 4, Data collection procedures,* The Open University press, 1979

The ethnographic method of research has a number of weaknesses: it has low internal validity, low reliability and low population validity. It is generally suited to small scale exploratory work to discover areas worth further investigation; cross validating in a natural setting results achieved by other methods; investigating relatively unknown social phenomena in detail in their natural setting to develop theories to be validated by other research methods.

8.1.3.3 Action Research

A variation of ethnography is action research. In most research projects the researcher aims to be detached and not interfere with that which is being studied. In action research, however, the researcher is actively involved in planning and introducing some change in policy and then using research expertise to monitor and possibly evaluate its effect (McNeil, 1990). The joint endeavour generally leads to the increased commitment of both parties to the diagnosis, (Baburoglu, 1992).

Action research involves the planned intervention by a researcher into a naturally occurring event. The effects are then monitored to discern whether or not the action has produced the expected consequences. The researchers intervention is then an intrinsic part of the research design. Gill and Johnson (1991) describe the action research route as an iterative one; whereby the problem is presented at entry by either the client or the researcher, the diagnosis is then joint between the two parties. The action is through feedback and the evaluation presents new problems which recycles the research. This is reflected in the action research cycle indicated in figure 8.3 as presented by Susman (1983).

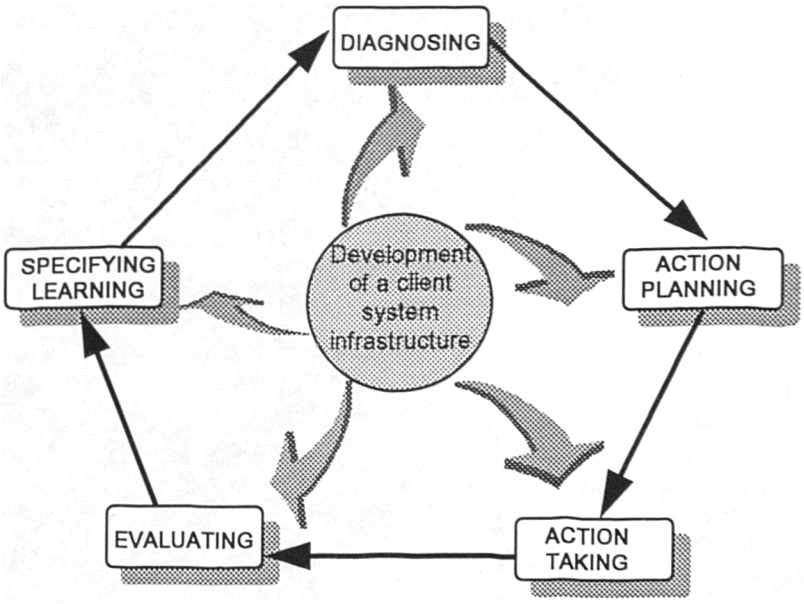


Figure 8.3 The Action Research cycle
Adapted from Source: **Susman**, *Action Research a sociotechnical systems perspective*, in Morgan (Ed) Beyond Method, 1983, p95

The most commonly used definition of action research is that of Rapoport (1970) in which he states that action research is *"a general mode of inquiry that seeks to contribute to the practical concerns of people in a problematic situation and to the goals of social science within a mutually acceptable ethical framework".* In this regard the action researcher is often referred to as a "change agent" (Rapoport, 1970; Foster, 1972).

Susman and Evered (1978) describe six characteristics of action research:

- AR is future oriented trying to improve the future of people
- AR is collaborative, obliging the researcher to clarify and represent their own ethics and values
- AR implies system development
- AR generates theory grounded in action
- AR is agnostic in that theories and prescriptions for action are themselves the product of previously taken action
- AR is situational, based on actors defining their current situation.

Four types of action research (AR) can be identified (Susman and Evered, 1978: Foster, 1972) :

- Diagnostic AR: the researcher is only involved in collecting the data for diagnosis and feeding back into the client system
- Empirical AR: the researcher only evaluates the options undertaken by the client system and feeds data back to it
- Participant AR: diagnosing and action planning is carried out in collaboration between the researcher and the client system
- Experimental AR: researcher and client system collaborate in all phases to set up an experiment for taking an action.

The use of these will depend upon the objectives of the client and researcher and the access enjoyed by the researcher within the client organisation.

Action research has been criticised in the past for being a "muddled science" as it dismisses the outside observer and independent experimenter (Winter, 1987). It has also been dismissed as being idealistic and because it sits in between practical and theoretical practice, it is said to lack theoretical definition. In addition, Rapoport (1970) highlights three dilemmas concerning this method of research. The first of these is the matter of ethics in terms of respondent protection, awareness of personal and political motives. A good action researcher will not become captive of one organisation. The second dilemma concerns the conflict of goals that may arise between the demands for help by the client organisation and the demands of the research. Finally the third dilemma concerns the shifting focus of initiative from the client to the action researcher as the research progresses. The client is often not a simple one and the action researcher must seek multiple support and participation. Resolution of these three dilemmas is an important part of the work of action researchers.

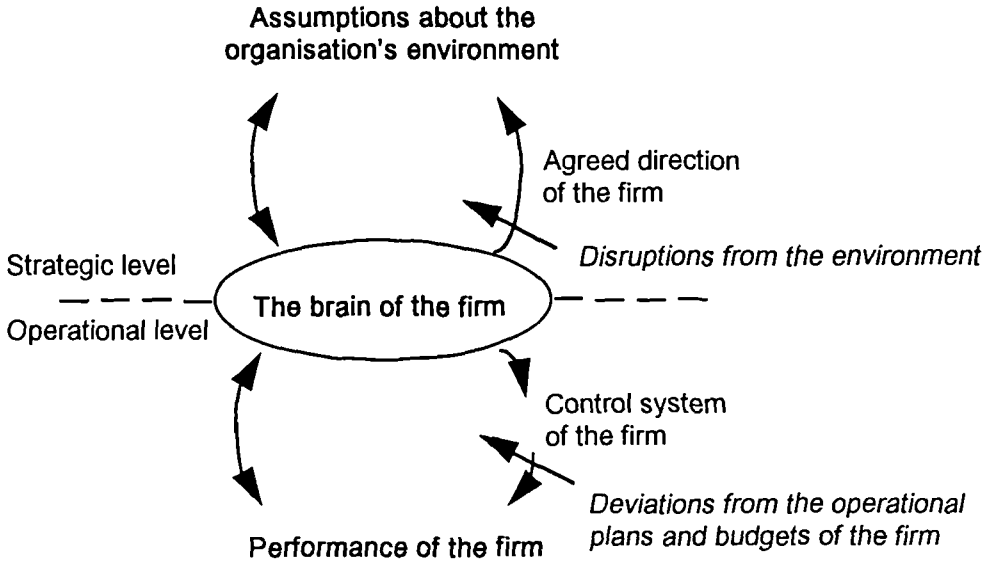


Figure 8.4 Operational and strategic learning loops
Source: **Garratt**, in Action Learning in practice, Mike Pedler, Gower, 1983

Action research forms part of the action learning loop, which involves the whole organisation in a learning process through which the senior functional managers are activated to tackle key organisational survival projects; top management is activated to reconsider their thinking and the approaches of action research are disseminated to the wider employee base. This is termed two loop learning (Garratt, 1983, figure 8.4). Once this is embarked upon the action researcher is involved in a web of activity as described in figure 8.5, involving many participants and many objectives.

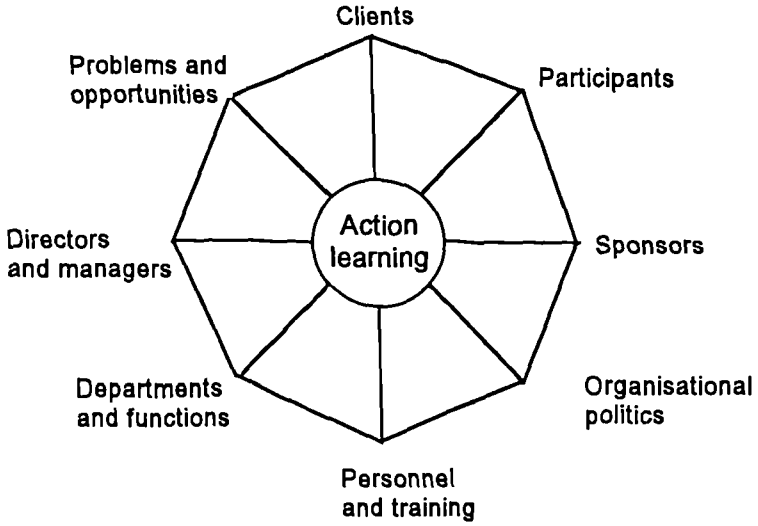


Figure 8.5 The web of activities surrounding action learning
Source: **Pearce**, *The role of the personnel specialist,* in Action learning in practice, Pedler, Gower, 1983

For this reason the action research methodology may involve many forms of data collection as discussed by Cunningham (1988) in his description of **interactive holistic research.** This is based on the work of Reason (1988) in which he describes the shift in research paradigm required for modern qualitative research:

- *Participatory and holistic knowing is a move from the distance and separateness of objectivity*
- *A shift from objective consciousness to a quality of awareness called subjectivity where we use our experience as part of the inquiry process*
- *Knowledge forms itself in action rather than existing for reflection.*

These thoughts build on the action research methodology, iteratively enhancing the validity of the research by cycling between reflection and experience (Heron, 1988). Heron describes validity as the quality of being well founded. He concludes that holistic action research is far from being invalid since the research is consummated through action. It is here that the picture of the chosen research methodology begins to form.

Table 8.1 lists the characteristics of the research project that lead to the choice of the action research methodology. It is necessary to consider the effects of the research taking place within the researchers own organisation. The implications of these advantages and disadvantages, as presented in table 8.2, must form part of the choice of research strategy.

- The organisation was undergoing significant change during the period of the research.
- Full access to the organisation could be achieved by the researcher.
- The research was inherently participative since the researcher is a member of the sponsoring organisation.
- Members of the organisation had to be involved in order to gain commitment to the research.
- Implementation was required during the research period in order to test the research model.
- The project management process under consideration involves many aspects of the organisation.
- Much of the research data was based on human interaction within the project management process.

Table 8.1 Characteristics of the research project

The data collection methods combine to form a web of interactive research, reflecting that used by Cunningham (1988). This is depicted in figure 6.6, in which Cunningham attempts to reduce the distance between the action researcher and the action. Rose (1991) affirms this view by promoting the use of *triangulation*, mixing a variety of research methods and combining the results of each to form more valid results.

Advantages	*Access to the field is already enjoyed by the researcher.* *Good position to negotiate permission to carry out research.* *Network of colleagues from whom to collect information and maintain contact.* *Can short cut some of the time consuming and stressful aspects of field work in novel settings.* *The researcher has a stock of background information.* *A working knowledge of routine tasks and schedules.* *Jargon familiar.*
Disadvantages	*More difficult to distance oneself as a well established participant.* *Over familiarity can deprive a researcher of valuable resource: the cutting edge of "strangeness" is dulled.* *The researcher will be involved in existing patterns of social interaction, influence and authority.* *Role conflict may occur.*

Table 8.2 The implications of conducting research within one's own organisation. Source: **Open University**, *Research methods in Education and Social Sciences, Block 4*, The Open University press, 1979.

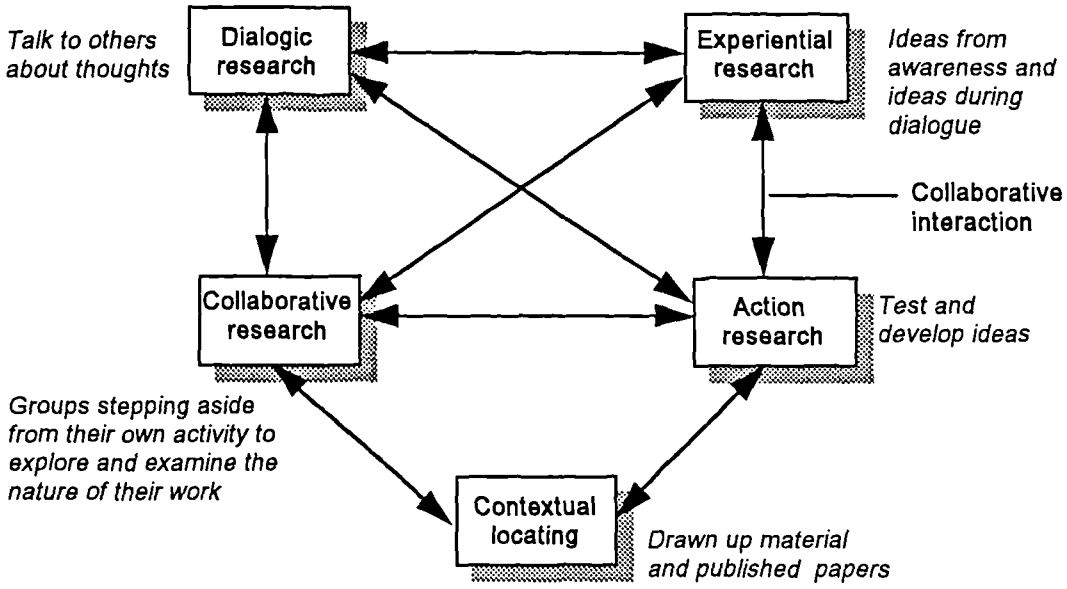


Figure 8.6 Interactive holistic research process
Source: **Cunningham**, *Interactive holistic research: researching self managed learning*, in Reason, Human inquiry in action, Sage, 1988, p163

The nature of this research project lead to the need to collect data from a number of sources. In order to interconnect these and use one to spark further inquiry in another area, it was necessary to take an holistic view of the research methodology.

The following is a list of some of the research methods that were considered necessary to achieve optimum coverage within the research period:

Simple dialogue: to keep abreast of the organisational and project management changes within the sponsoring organisation

Document analysis: to review nature and completeness of documentation and track changes with time

Group administered questionnaire: to assess qualitatively attitudes within the sponsoring organisation

Interviews: to investigate specific areas and personnel of influence within the sponsoring organisation;

International interviews: to conduct international data collection in the most efficient and effective means

Group discussions: to conduct data collection bringing together a mix of participants to the project management process, thus investigating the complex human interactions witnessed during a construction project

Presentations: to gradually feed information into the sponsoring organisation and receive feedback of the previous actions taken due to the research

Attendance at working group meetings: to inject research conclusions into new initiatives and gradually implement changes across the organisation in accordance with the action research methodology.

Cunningham (1988) calls for the interactive interplay of modes of research in order to gain optimum validity and coverage. The ideal is to run the techniques concurrently in order to investigate existing theories and ideas (contextual locating); understand the situations and contexts of human action (action research); achieve interaction with others (dialogue research and collaborative

research); acknowledge and utilise one's self (experiential research).

It has become evident therefore that the data concerned here is qualitative, requiring *rich* data collection techniques to ensure the issues are fully understood. In order to increase the validity of the research and to enable collection from a number of sources it becomes necessary to combine and triangulate the results from each of the research methods. In this holistic approach to research the results build up as themes develop.

8.1.4 Data analysis techniques

Analysis of qualitative data is often identified as a problem area due to it's volume and diversity. The data collected by means of an interactive holistic approach as recommended here, must be analysed as a whole. There are two main methods for achieving this (Easterby Smith et al, 1991). In the first method the researcher effectively goes by frequency of events converting the qualitative data into numbers which are seen as politically more acceptable. This is considered by some researchers to spoil the richness of the data and fails to give the holistic view so important in qualitative data. The second method, known as grounded theory allows the researcher to go by "feel and intuition" aiming to produce common and contradictory themes and patterns. A comparison of these two approaches is given in table 8.3, highlighting that the grounded theory approach is good for dealing with transcripts, simplifying the large amounts of non standard data produced by qualitative studies.

Content analysis	Grounded theory
Bitty	Holistic
Go by frequency	Go by feel
Objectivity	Closer to data
Deductive	Inductive
Testing hypothesis	Testing out themes, developing patterns

Table 8.3 Comparison of content analysis to grounded theory approach

The grounded theory approach (Glaser and Strauss, 1967) constantly compares and contrasts data and theory throughout the data collection and analysis process. Evolving theory directs attention to previously established important dimensions while the actual data simultaneously focuses attention on the theory's suitability as a frame of reference for the most recent data being collected.

In the work of Isabella (1990) where the interpretations of change by managers within an organisation were studied using grounded theory, the researcher kept observational notes on the facts, specific details and other information. As themes developed from the interviews and participants seemed to repeat details the theory evolved. A number of initial categories were set up and then were continually modified as new evidence arose. At the end of data collection each event description was systematically examined for evidence of data fitting these categories. These coded categories were then examined for patterns, themes that would account for the frequency, strength and presence or absence of any category.

By the use of grounded theory the route through the data collection and analysis phase is steered according to the emerging themes. Easterby Smith et al (1991) identify a series of stages:

- **Familiarisation** emerges first thoughts
- **Reflection** where a process of evaluation and critique becomes evident, developing a whole range of loose hypotheses
- **Conceptualisation** where one goes back to the data and highlights where the hypotheses appear
- **Cataloguing** concepts on index cards or similar
- **Recoding** and redefining information. This may require the categories to be collapsed
- **Linking** the variables to a more holistic theory
- **Reevaluate** after comments from others.

The data collected during interviews and group discussions is voluminous and complex. The use of grounded theory should allow the theory to gradually develop as themes emerge from the group discussions, interviews and surveys.

In summary, section 8.1 has developed the research method based upon the available theory. The early decision that the data would be qualitative was based upon the requirement for rich data, interpreting the interactions founds during a construction project. This focused the sampling investigation to a number of non probabilistic techniques, whereby specific personalities and job roles could be investigated to form interpretations from specific perspectives. In order to increase the validity of the research data, it was decided to combine a number of data collection techniques holistically. In this way the results from a variety of data collection methods could be compounded to draw conclusions and build up theory through the grounded theory method of data collection. The discussion also introduced the action research method acting as an enveloping methodology to surround the whole research project. The fact that the objective was to effect change within the sponsoring organisation, lead to the necessity to manage the change and introduce a new culture slowly and in a controlled manner. For this reason the action research methodology was appropriate.

The remainder of the chapter will discuss the specific techniques used relating each to this interactive holistic research framework. The samples used will be presented and the data collection methods discussed for the two primary stages of the research project, ie the pilot work and the main research. Section 8.2 will therefore build upon the conclusions of this section by describing how the research method was implemented during the research period.

8.2 Chosen research methodology

The research process was attempting to build a picture or model of the strategic project management process, by combining information from a number of sources. The process was therefore sequential and cyclical as new information both added to the theory and lead to other lines of inquiry (figure 8.7). The process represented a gradual learning, through the action learning cycle discussed in the previous section, between the researcher and the sponsoring organisation. Feedback was constant during the cycle filtering information into the organisation to action the research.

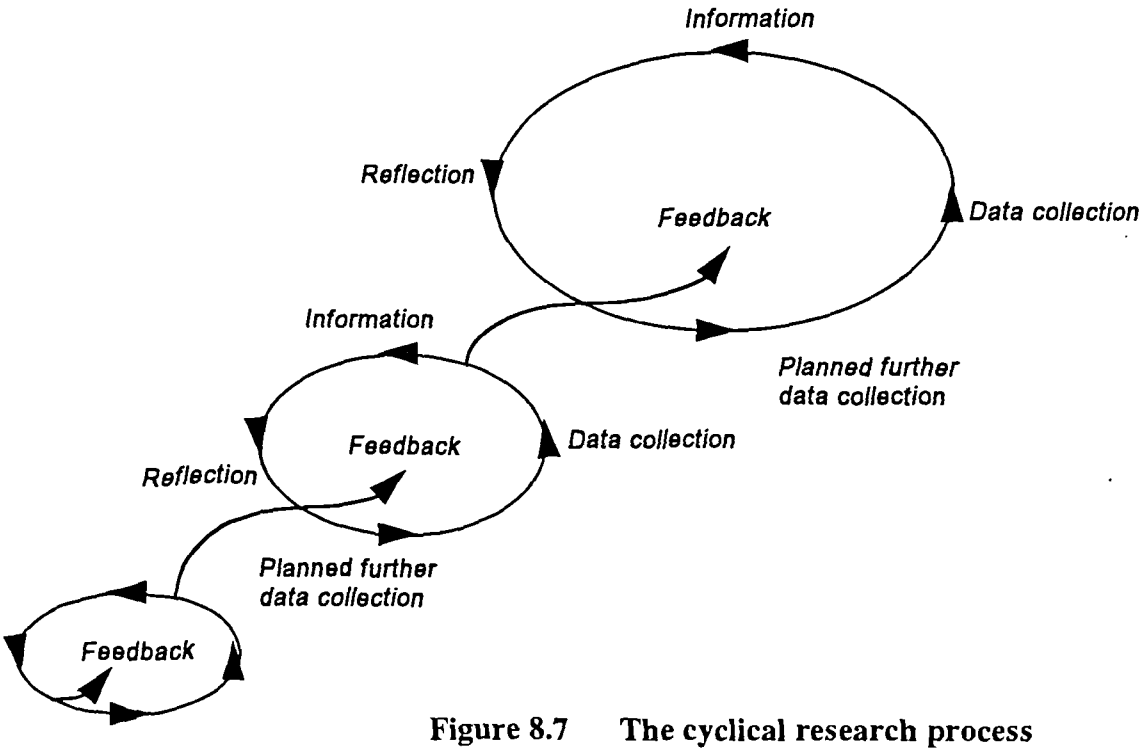


Figure 8.7 The cyclical research process
Source: Author 1994

Whilst cyclical the research process can broadly be split into two separate parts linked by the research model development. The methods used during each of these phases are indicated in figure 8.8.

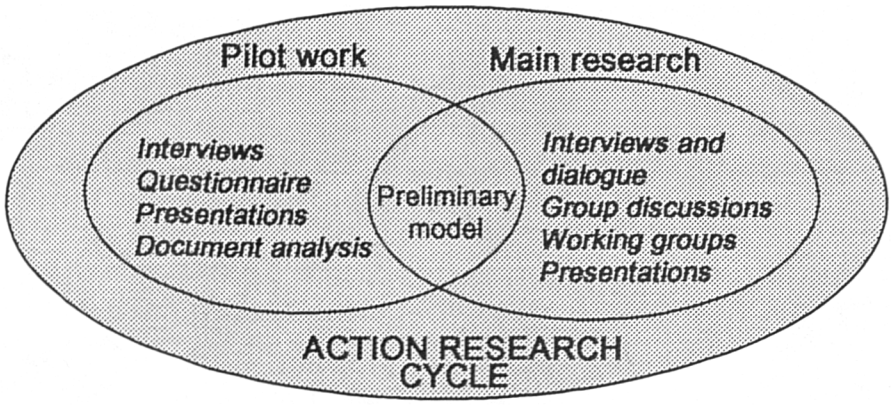


Figure 8.8 Research methodology: the two primary stages.
Source: Author 1994

The overall research strategy has been placed within a time related schematic to represent the approximate sequence of events as they occurred. It is useful to refer to this schematic (figure 8.9) as the discussion proceeds to place the research methods into context. For each of the research methods used the following section will highlight the objective, the sample choice and give a brief resume of the work conducted.

The objective of the pilot work was to develop a preliminary model forming the basis of the main research phase. This took the form of survey research, document analysis and presentations with feedback from the sponsoring client organisation. At the end of the pilot work a preliminary working model had been developed, marking the start of the main research stage. The objective of the main research stage was to test the research model both within the sponsoring organisation and within other client organisations with similar issues. During the main research period interviews were conducted within the UK construction client base, the US construction client base and the Japanese construction industry as comparison. It was the specific request of the sponsoring organisation to benchmark North American and Japanese methods of project management, having identified areas of best practice. In addition group discussion were conducted within each business unit of BAA and seven other client organisations.

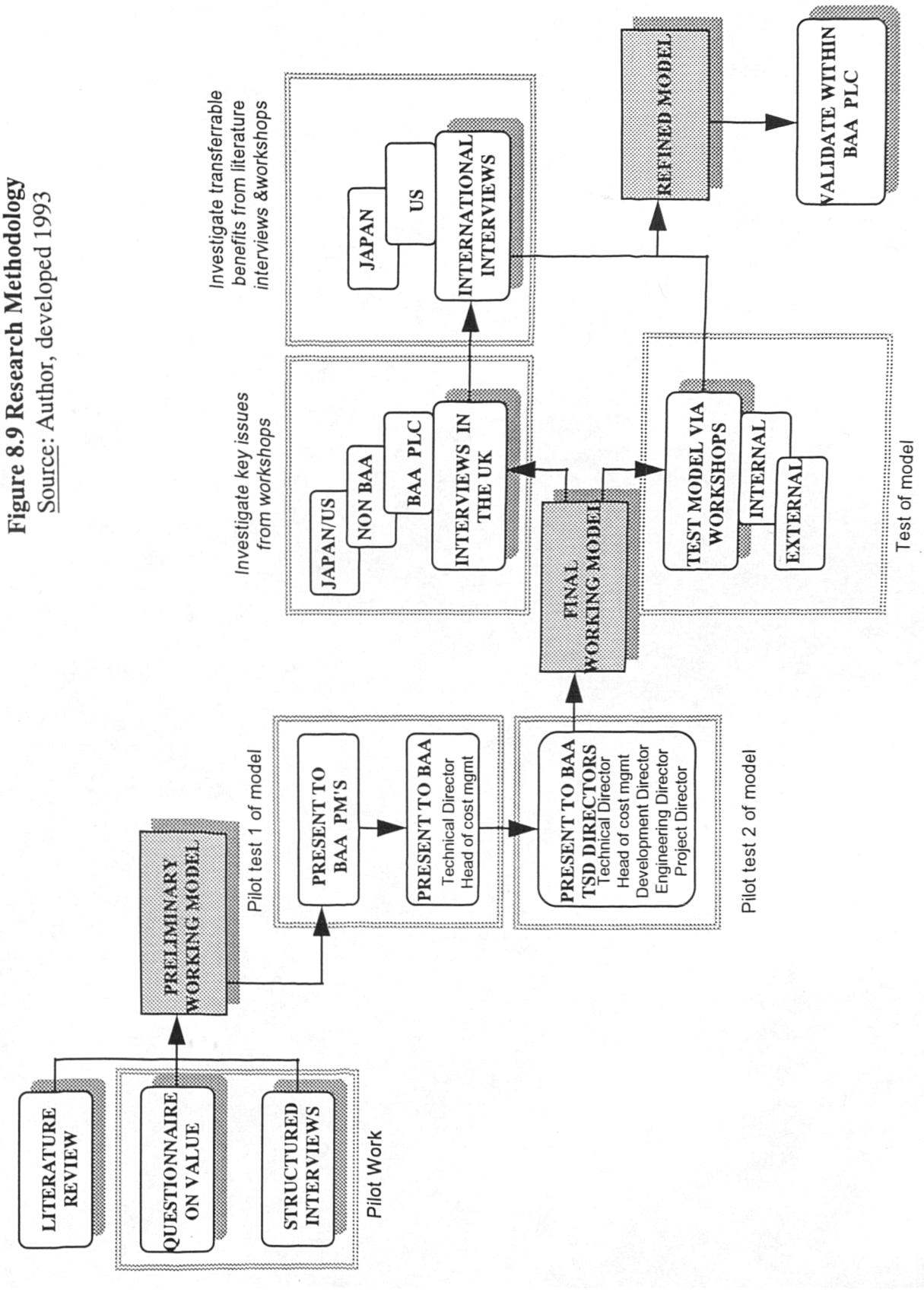


Figure 8.9 Research Methodology
Source: Author, developed 1993

Each of these will be considered independently, whilst bearing in mind their interdependence and concurrency.

8.2.1 Pilot study

The pilot study was conducted in order to highlight the main areas for input to the preliminary model for testing during the main research. *For purposes of clarity the results of the pilot study will be documented in this section. However, these results were combined with the literature synthesis in the formulation of the preliminary working model.* The pilot study combined the results from four data collection methods. The objective and chosen sample of each of the data collection methods are tabulated below:

Questionnaire survey	**Objective:** To test the current perception of value and value for money within the project management context to act as a starting point for development of a model to enhance value for money.
Reason for choice: A snapshot of the organisation across a large sample was required to provide ratios of the current knowledge and understanding. It was necessary to seek trends in regional and hierarchical perceptions of value for money. A questionnaire survey could ask specific questions to achieve this information on the basic level required.	
Sample: A stratified cluster sample was taken from within BAA plc. The sample consisted of all 53 project managers across all seven airport business units.	
Notes on administration: A mix of qualitative and quantitative questions were put within the questionnaire in order to receive both perceptions and specific statistically based answers. In order to increase the return rate the questionnaires were given out within group meetings at each of the business units within BAA. Thus queries could be answered and the forms collected at the end of the meeting, achieving an 89 % return rate.	
Results format: The questionnaire and a full analysis of the questionnaire results are held in appendix A1.	

Table 8.4 Chosen characteristics of the questionnaire survey

Interview survey	**Objective**: To introduce the research to a mixed group of managers within the sponsoring organisation. To seek out specific barriers to the achievement of value for money raising issues for the model development. To respond to gaps in knowledge uncovered from the questionnaire and literature.
Reason for choice: The information required at this stage of the research was detailed and required probing and discussion with particular members of the organisation. The nature of the questions were open, some requiring explanation. It was therefore felt that an interviewer administered questionnaire was appropriate for this data collection.	
Sample: Purposive sampling was used to target the personnel who could provide the right level of information. Whilst a mix of management levels and locations was attempted, it was often the case that specific personnel were sampled to respond to specific questions. The full list of those interviewed may be found in appendix B1, it was made up of BAA and non BAA managers, in order to widen the scope of the results. Both client representatives, contractors, suppliers and customers were interviewed in order to encompass the whole value chain. The sample also included Japanese and North American managers resident in the UK, whilst working for international client organisations.	
Notes on administration: In each case a questionnaire template was drafted as a guide to the researcher and to ensure that all the information was gathered during the length of the interview. The questionnaires were specific to each interview. The interviewee was briefly introduced to the area of research prior to asking the questions without biasing the answers. Probing and digression from the questionnaire template was conducted where this would add to the quality and richness of the data collected. Where appropriate the interview was tape recorded for transcription after the interview.	
Results format: Appendix B2 contains summary notes from each of these interviews, reduced from the full transcriptions to draw out the important and relevant points.	

Table 8.5 Chosen characteristics of the interview survey

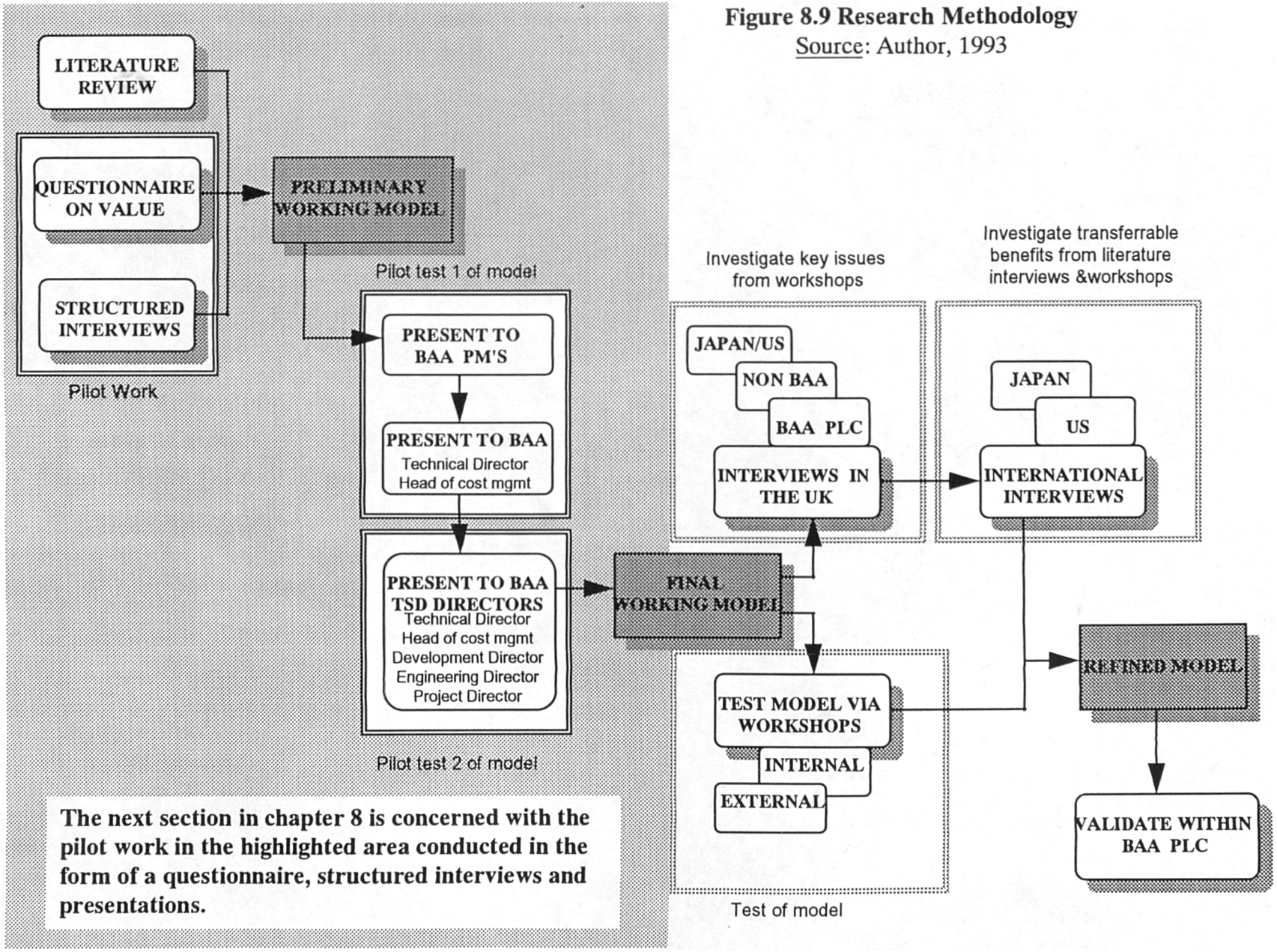
Document analysis	**Objective**: To gain an appreciation of the current and past practice in project management within BAA plc
Reason for choice: It was necessary to back up the information received from the interviews with direct information from documents produced during projects and with reference to projects. The analysis of documents allowed the researcher to draw specific information and recognise changes in practice over time.	
Sample: The documents consisted of Value Management reports, Cost control documents, Project briefing documents, Project feasibility studies, Post project reports, Policy notes and guidance documents for the management of project issues.	
Notes on administration: The documents were discussed with members of the organisation and then reviewed in isolation in order to remove bias from the analysis.	
Results format: Appendix C contains a list of the documents analysed during the period of the research.	

Table 8.6 Chosen characteristics of the document analysis

Feedback presentations	**Objective**: To act as feedback to the sponsoring organisation fulfilling the collaborative objectives. To pilot test the format and clarity of the preliminary research model during development. To maintain commitment to and understanding of the research objectives from senior management.
Reason for choice: In order to achieve maximum benefit from the feedback sessions it was decided that a formal presentation to senior management would spark discussion and raise the profile of the research. It also allowed the organisation to remain aware of the progress of the research and become involved in its development. This allowed cyclical collaboration between the researcher and the organisation.	
Sample: The sampling was conducted on a purposive basis to target the senior management within the sponsoring organisation.	
Notes on administration: At each presentation the group were given a summary document of the progress of the research to date. The presentation was conducted in slide format, following which the group were encouraged to challenge the content.	

Table 8.7 Chosen characteristics of the feedback presentations

Figure 8.9 Research Methodology
Source: Author, 1993



8.2.2 Results from pilot study

A full analysis of the data is held within appendix 8. Appendix 8 contains the majority of the results and conclusions from the pilot study. Whilst many important learning points and results were achieved from the data collection methods used in the pilot study, this section will only highlight the major implications for the strategic project management model resulting from the pilot work. As stated these were used in the synthesis of the preliminary working model developed in chapter 7.

The results from the document and questionnaire analyses fall into two main areas: those related specifically to the management of value within BAA and those related to the implementation of a method to manage value. Specific results were fed back into the organisation in order to facilitate the development of the value management function being conducted.

The questionnaire on BAA's perception of value was analysed quantitatively, revealing that the definition of **Value** is understood fairly well within BAA plc, so the important element to develop is a method to capture this knowledge within the project. Whilst these results formed useful feedback to the Value Management department within BAA, the main benefit arose from the qualitative information captured within the comments. The comments in table 8.8 were drawn from the questionnaire, representing the recurring themes. The main conclusion from these results is that techniques for achieving value are limited to a stab at the project allowing the project manager to hurdle onto the next stage of his / her project. This has resulted in scepticism and resentment by the project members due to the top down autocratic way in which the value management implementation process has been perceived. In this regard the questionnaires indicated that the real issues were concerned the implementation of initiatives within BAA plc, rather than the actual processes themselves.

Analysis of the interview data resulted in a combination of implications for the model; these have been grouped into common themes and tabulated in tables 8.9a-e The results indicate the awareness of the sample of the need for methods to achieve integration within the management of value spanning the whole project organisation.

The management of value requires time: time to plan, time to implement. When the proposals come back time is required for their inclusion into the project as changes. Time is something not available in BAA projects, therefore a culture shift is required by the whole organisation to facilitate the management of value. Difficulty is found in achieving agreement on value and objectives between all parties to the value management process. It relies on sufficient information at the outset and the ability to refine and compromise between objectives. The implementation of value management within BAA is perceived by many involved in the process to be a hurdle, something required by "big brother" before the project can continue. Resentment is therefore exhibited between the project team and the central coordinators of this approach. Team composition and management is considered important in defining and achieving value. Power and politics lead to poor communication and conflicting objectives.

Table 8.8 Significant points from document and questionnaire analyses

Theme of results group:	*The research model should be designed in sympathy with the culture of the organisation, involving members of the organisation.*
· The BAA organisation has a very strong subcultural approach to problems. The overall coordination of the sub cultural efforts and processes is required, to provide strategic direction and a coordinated approach to projects. · The model design should be sympathetic to it's implementation. · All members of the organisation should be involved in the change process.	

Table 8.9a Results from pilot interviews grouped into themes impacting the research model.

Table 8.9b,c,d Results from pilot interviews grouped into themes impacting the research model.

Theme of results group:	*A balance of senior management input and PM empowerment to allow structured decision making*
· Project management empowerment should be balanced with controlled senior management involvement. · Political influence must be recognised but minimised · Formal decision making process should facilitate timely management of the client organisation · Organisational feedback and learning must be facilitated by loops in the model · Ensure flexibility to accommodate fast track projects.	

Theme of results group:	*The important procurement decisions are strategic in nature and must be considered at the very start of a project with an aim to reducing barriers to value and increasing communication.*
· The project should be arranged to maximise communication and open flow of information between the CM and PM. · Simultaneous engineering should be strived for. · Long term relationships with suppliers will reduce learning curve; develop a family of contractors for use on projects. · Consideration should be given to partnering between client and construction manager. · Earlier construction input. · Identify a team and strive for full teamwork. · Tighten up client / end user relationship before start of the project. Designers must listen to the end user.	

Theme of results group:	*The model should bring together the strategic project function with the life cycle management of projects, allowing horizontal and vertical control.*
· A strategic view of project for better integration of project stages · Reflect link between projects and strategy. · Learning must be facilitated across the whole value chain. · Establish a strategic interface between projects and planning. · Strategic influence over non airport projects on the airport. · Portfolio PM to ensure strategic project decisions are correct. · Value engineering should be part of an overall process rather than selected "audits" at a point in time.	

Theme of results group:	*Value should be determined for each project and updated through the use feedback loops.*
· Assess needs early in the project. · Life cycle costing should be part of the value assessment. · Systematically establish and review project goals. · Gradually develop brief to reflect information as it arises. · Use of functional analysis causes confusion: balance by using objectives analysis. · It is necessary to define value for each project since a corporate definition of value is not enough for the specific and unique circumstances of a project.	

Table 8.9e Results from pilot interviews grouped into themes

With reference to the interview transcripts, it is interesting to note the emphasis held by the BAA sample compared with those of the non BAA sample: The themes arising from the non BAA sample emphasised the importance of a cohesive team with open communication and early involvement of the construction expertise. The non BAA sample referred to the need for decision making structures within the client organisation, expressing a frustration at the lack of control of client decision making and changes. Long term relationships to build on the learning curve of each project and careful nurturing of these relationships was called for.

The BAA sample did discuss these new trends in project delivery techniques but placed their emphasis on the implementation of a system to improve the processes and controls. Concern was shown over the lack of central control and strategic procurement awareness within the organisation.

In summary therefore the results from the pilot study detailed in Appendices A,B, C and outlined in table 8.9 were combined with the conclusions from the literature review in formulating a model of the strategic project management process. The views of the interview sample very much reflected the conclusions of the literature review confirming the research model characteristics highlighted from the literature.

8.2.3 Main research methods

Group discussions in BAA plc	**Objective**: To test the research model within the BAA plc project stakeholder environment in order to establish whether it remains applicable to the problems and issues of the "sharp end" of project management.
Reason for choice: Projects within BAA take place within a political and complex environment impacting greatly on the project itself. In order to reconstruct this environment and therefore test its effects, a group discussion was considered the most effective research method. By bringing together the stakeholders present in a normal project to discuss the issues involved in the management of projects, the objectives would be achieved and also allow the researcher to observe the interaction and attitude divergence within the group. This method of data collection would highlight issues and facilitate discussion of ways to overcome problems. In this way the organisation would be involved in solving their own problems and the action research would filter back into the organisation through the members of the group allowing the action learning cycle to be closed.	
Sample: Two stage stratified sampling was used to choose the groups to represent the project environment. Groups that have a stake in major projects in BAA were identified and personnel drawn randomly from this stratified sample. The final choices reflected the project and stakeholder team that one might expect on a project. The list of the samples for these group discussions may be found in appendix E2	
Notes on administration: Prior to the workshop, as the group discussion was called, a document containing a copy of the slides was sent to the participants in order to familiarise them with the topic for consideration. The agenda lasted for three hours starting with a slide presentation of the research model. Following a question and answer session the group were asked to complete a brief questionnaire to capture their individual thoughts on the advantages and disadvantages of the model. A group discussion then took place facilitated by the researcher to identify specific issues and seek resolution within the group as to suitable amendments to the model to reflect the issues raised in the discussion.	
Results format: The agenda for the workshop accompanied by a list of participants may be found in appendix E. This appendix also contains a summary of the advantages and disadvantages of the model as well as specific concerns and issues of the group emerging from the discussion.	

Table 8.10a Chosen characteristics of the group discussions within BAA plc

Group discussions within the UK client base	**Objective**: To investigate the project process throughout the UK client base, with a view to testing the research model; learning from the experience of a broad sample of client organisations and benchmarking BAAs project management process with those of the sample.
Reason for choice: The group discussions were extended to other client organisations in order to remove bias and narrow focus from the research. By conducting the same group discussion within other client organisations comparisons in style, approach and process could be made. In this way a benchmarking exercise could be conducted between the current practice of BAA, the current practice of the sample and the research model.	
Sample: Two stage stratified sampling was used, the first stage of which was to select a sample of client organisations from within a specific group. The sample were required to fulfil a number of criteria in order to be able to compare with BAA projects for the benchmarking process. The organisation was required to be a large client organisation, regularly procuring buildings or projects; a customer interface in projects was necessary to reflect the stakeholders issues and the nature of the projects must contain some complexity (such as 24 hour operation, safety, large number of stakeholders). The sample consists of seven client organisations (see appendix E2). A central coordinator at senior management level was established within each of the sample companies through investigation and direct contact.	
Notes on administration: Having made contact with the client organisations it was important to gain agreement to conduct a three hour group discussion with members of their organisation. The agenda for the workshop was therefore amended to emphasise the challenging nature of the process for all involved. Workshop notes were sent to the central coordinator two weeks prior to the workshop. The workshop was conducted in the same manner as the BAA workshop, but the group was additionally split into syndicate groups to discuss the advantages and disadvantages in relation to their own current practice. The group were then brought back together to present their findings. In this way all the research objectives could be fulfilled as well as providing meaningful and challenging session for the participant organisations.	
Results format: The agenda for the workshop accompanied by a list of participants may be found in appendix E3. This appendix also contains a summary of the advantages and disadvantages of the model as well as specific concerns and issues of the group emerging from the discussion.	

Table 8.10b Chosen characteristics from group discussion within the UK client base

International benchmarking interviews	**Objective**: To investigate the Project Management systems in use in the US and Japan, with a view to incorporating any useful features into the research framework.
Reason for choice: It was decided that a visit to each of these locations was necessary in order to experience the construction culture and the quality of construction projects first hand. Face to face interviews would help break down the cultural barrier that may exist in a postal questionnaire. It was anticipated from the literature that the relevant information would be held within the attitudes and culture rather than in processes and therefore it was necessary to ask in depth questions. The benchmarking exercise was conducted in response to a direct request from the sponsoring organisation to investigate best practice in these two areas. However, interviews were conducted with two European airports undergoing major redevelopments.	
Sample: Sampling within an international frame of reference was difficult due to the limited access to sample population and the complexity of communications. The organisation sample in the US was taken from a list of top constructors from the client perspective in two main regions of the population. Having established the organisations within the sample, a contact was made within each at senior management level. This was achieved with the assistance of a central contact in each location. For the Japanese interviews the culture actually dictated the way in which the contacts were made and the actual sample to some degree. It was necessary out of courtesy to receive a formal introduction to senior management of a Japanese organisation. For this reason contact was made with the UK offices of each of the chosen sample. An official introduction was then established with Japan and appointments arranged.	
Notes on administration: Having established contacts within the sample a copy of the questionnaire template was sent at least two weeks in advance. This was to enable preparation of material and translation where necessary. For the Japanese interviews, the questionnaire was amended to be less direct in sympathy with the culture, and reflect the slightly different construction industry structure. Nevertheless, the questionnaires were seeking answers to the same questions. In addition a resume of the research objectives was sent in order to contextualise the research. Where appropriate site visits were arranged in order to witness construction and test the quality of the end product. In each case the interview was recorded for later transcription.	
Results format: Appendix F contains a list of the interview sample, a copy of each questionnaire and a summary of each interview, reduced from the full transcription.	

Table 8.10c Chosen characteristics of the international benchmarking interviews

8.2.4 Data analysis techniques

The data collected was of qualitative nature, rich in content and voluminous. For this reason it was appropriate to utilise *grounded theory* in reducing the large volumes of data into themes, developing theories as the data emerged from various methods of data collection. Hypotheses were not developed since it was the intention to test the suitability of the research model in "real life" application.

In practice the interview transcripts were analysed by reading through to highlight common areas of theory. As the data increased these themes could be recognised across the interviews and theories developed as themes were confirmed by a growing samples. The theories developed were of a number of forms:

- Issues arising in the implementation of the model into real life - ie areas where the model would not work in real projects.
- Gaps in the model, highlighted by the sample
- Areas where the model was considered inappropriate by the sample.

The model was thus added to or removed from, so simply amended to reflect the theories as they emerged. Theories only developed out of commonly identified themes, ie issues highlighted by more than one sample.

For the sample outwith BAA the use of *benchmarking* allowed the researcher to highlight gaps between the research model and areas of best practice found in other organisations. In these situations, particular tools and techniques may have been added to the research model to build in "best practice".

8.2.5 Implementation through action research

During the research period the theory was built up iteratively as themes developed and the model was gradually amended to reflect the new theories. Throughout this period feedback was made to the sponsoring organisation and attendance made on working groups. In this way the model was actioned through injection into the system through researcher involvement in organisational continuous improvement workshops.

Due to this *participant action research* methodology aspects of the model were iteratively developed with and communicated to the organisation. At the time of completion these aspects of the model had been implemented and were part of the project management process. The results chapter presents in more detail the outcome of the action research methodology.

Final validation of the full model was achieved by a presentation to a random sample of the sponsoring organisation and members of the participating organisations involved in the research study. The formal presentation took place within the sponsoring organisation at the end of the research period.

8.3 Summary

This chapter has identified four areas of concern when choosing a research strategy: theory and data, sampling and population, design of data collection and data analysis techniques. Quantitative and qualitative data was introduced comparing the techniques and problems in dealing with each. Having identified that the research data being dealt with in this study is qualitative, the discussion went on to introduce the sampling methods available to represent the population and collect the required data when dealing with qualitative samples. Probabilistic sampling methods whereby all members of the population have an equal chance of being selected were identified as unsuitable for qualitative data. It is normal that purposive sampling is conducted whereby the sample is selected to achieve specific objectives.

After reviewing the methods available for qualitative data collection it was argued that an holistic interactive methodology was suited to this research study. By this method the results from many forms of data collection are combined in an attempt to increase the validity of the collected data. In addition the action research methodology would form part of this holistic approach since the objective is to introduce a new strategic project management model into the sponsoring organisation. This allowed the researcher to gain full support and collaboration of the sponsoring organisation as the model was jointly developed by iteration with it's members. It has been argued that the grounded theory approach fulfils the complex demands of qualitative data analysis, building common and contradictory themes as the data is collected.

In conclusion therefore the chosen research strategy combined the use of the following methods of data collection in an interactive , holistic strategy using action research:

- Questionnaire analysis
- Interview surveys
- Document analysis
- Feedback presentations
- Group discussions
- International interviews

The analysis was achieved by use of grounded theory, developing areas of commonality as the research data grew. Sampling was achieved according to the requirements of the research method. By combining and interacting the results from each of these methods a model of the strategic project management process was developed, pilot tested and then developed with the sponsoring organisation into a framework for use within the project management of major projects. The use of action research allowed elements of the model to be injected into the organisation through feedback presentations, dialogue and implementation in continuous improvement workshops.

Having collected and analysed the data the next chapter will present the results following the development of the model through the action research process. Full results appear in appendix A through to F.

9 INTRODUCTION

The previous chapter detailed the method by which the research was conducted in order to test the research model. It was concluded that a variety of research methods were combined interactively in order to holistically analyse the results.

The pilot study combined the results from a questionnaire survey within the sponsoring organisation; a series of interviews with BAA staff and non BAA persons with a knowledge of the BAA project management system; analysis of project documents and presentations within BAA to feedback information for action and generate discussion. The previous chapter reported the results of these pilot studies.

This chapter will report the results of the main research methodology, combining a variety of data collection techniques in order to balance the collection of information with the requirement to generate action within BAA plc. The data collection methods used consisted of structured interviews within BAA and within organisations connected with or with similar characteristics to BAA; group discussions within each of the BAA airport business units in the form of interactive workshops; group discussions within seven organisations performing projects with similar characteristics to BAA projects; interviews with organisations in the US and Japan in order to benchmark the project process across the three locational centres.

The chapter is split into seven main sections presenting the results from the following:

9.1 Structured interviews in the UK to establish themes and investigate specific issues raised during the other forms of data collection.

9.2 Group discussion workshops conducted within BAA plc in order to test the preliminary model.

9.3 Benchmarking group discussion workshops in client organisations in the UK

9.4 North American benchmarking interviews to identify gaps in best practice between the UK and North America

The results of these data collection methods will be reported sequentially for clarity and ease of reference. However, the research methodology was designed as an interactive holistic approach, concurrently planned and conducted. In this way the results could be compounded to form themes for the grounded theory method of data analysis.

Each one of these methods will be reported independently then holistic conclusions will be drawn towards the end of the chapter. Much of the detail of the data collection is found in Appendices D,E and F. These should be referred to as appropriate. This chapter will display the results in summary form, drawing out the important themes from the full transcripts. In doing so, however, some important and relevant information regarding specific organisations and techniques may only appear within the appendix.

9.1 Results from the structured interviews to support model development

Objectives: To investigate particular issues emerging from the research data collection and fill gaps in the researchers knowledge regarding current practice within the three locational centres (UK, US and Japan).

These interviews were conducted throughout the research period, arising in response to other methods of data collection, or as a recommendation directly from another interview. A specific interview template was drawn up for each interview dependent upon the objectives and the length of time allocated. In general each interview was of one hour duration; however, where necessary these were extended when more information or site visits were required.

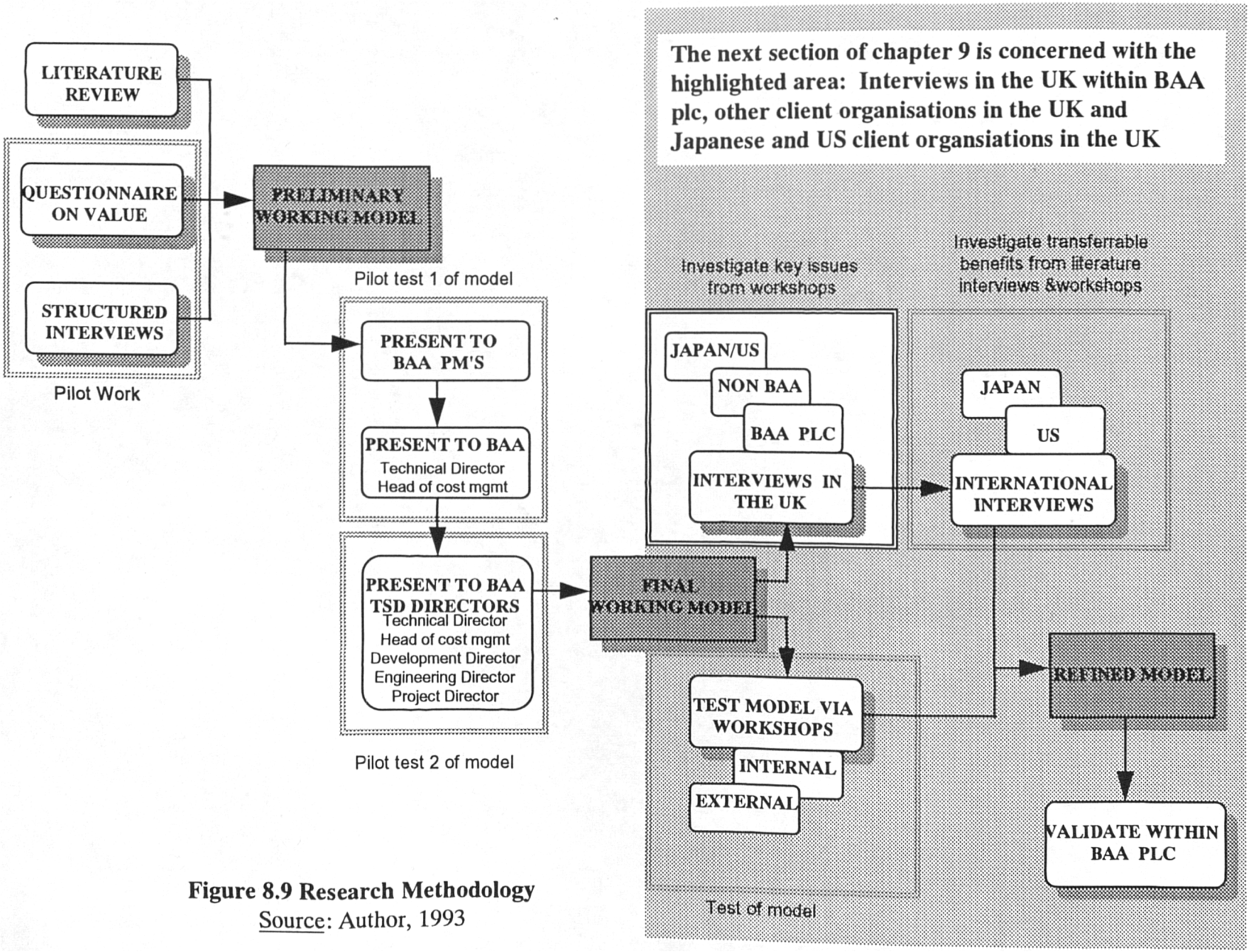


Figure 8.9 Research Methodology
Source: Author, 1993

Appendix D contains the specific list of participants together with the main points from each interview. The full transcripts were not reproduced as it was considered more useful to simply highlight the points of interest and relevance. This section will draw conclusions from these interviews by grouping the points into common themes for clarity. The section will present two groups of results:

- Common themes with implications upon the model
- Issues of interest relating to project management in general

The first set of results tabulates the themes with implications upon the model development (Tables 9.1a to 9.1g):

Theme of results group:	*Human issues should surround any project management process as it is fundamentally concerned with the integration of activities and people to achieve a goal.*
· Develop interrelationships between all parties · Motivate the project team as a whole, building in ownership · Build a relationship with the local community · Allocate specific Project Managers to specific projects dependent upon their skills and personality · The model should allow the project manager to tap into the professional experience held within the BAA organisation · Politics is often an overwhelming feature of projects and the management of people to reduce the implications of politics leads to reduced conflict	

Table 9.1a

Theme of results group:	*The model should streamline the client decision making process to ensure clarity, common goals and timely response to problems.*
· Project Manager empowerment was considered vital to project success by the majority of the sample, some of whom showed concern over the use of any project management model as it may constrain the project manager, reducing his/her autonomy. · The model must facilitate the needs of client decision making · The model must recognise that changes will occur and therefore accommodate them. · The briefing process should thoroughly define value for the project backed up by financial approvals. · The client group should be represented by one person through which decisions are made. · The model should facilitate thorough communications within the client organisation and between stakeholders to the project. · The client group must finish it's thinking before entering the design process. · The project should be defined to encompass common goals amongst the client and stakeholder group.	

Table 9.1b

Theme of results group:	*The activities conducted at strategic level should be centred around improving links between organisational and process interfaces*
· The use of strategic procurement to build a family of contractors should improve the links between the client and contractor value system. · Partnership with contractors is considered of benefit and is being pursued by a selection of the sample · The strategic management of a group of projects should improve the interface between individual projects and the strategic direction · The capital budget must be balanced across the projects with priority · Procurement issues should be injected at an early stage of the model to raise awareness of the possibilities · Not all projects will be suited to modularisation, however, standard design details and standard elements may improve constructibility and reduce cost across a group of projects · The selection of professionals may be assisted by a central database on past good performance · The model must balance these centrally controlled strategic elements whilst letting facilitating the management of projects within the airports · A strategic function can facilitate non adversarial contract development	

Table 9.1c

Theme of results group:	*The model must be flexible enough to deal with real life projects constrained by time, finance or of a small size.*
· The necessity for a structured model for small projects is as important as for major projects. · A framework for small projects should be simple to accommodate those with a very short duration as well as those forming part of a rolling program of works · The time requirements at the start of projects for planning and seeking approval from regulators should be built into any model · Any model or set of guidelines must be updated to remain applicable to the nature of projects conducted within an organisation.	

Table 9.1d

Theme of results group:	*Control mechanisms should be established to maximise the value to the project*
· The client should be kept informed of the progress of the project so that the result is expected · Post contract cost management should be structured to follow cost and changes. The documentation should be consistent across the organisation · Change management should be built into the value management process · Criteria for pre selection of contractors should be included in the project management procedures · Joint ownership of risk reduces conflict and allocates risk where it can best be managed	

Table 9.1e

Theme of results group:	*Feedback should be built into all stages of the model to ensure the project is aligned with changes in the environment.*
· Consistently monitor the environment and build in checks to ensure the brief remains accurate. · Value for money shifts with time · Cost and technical expertise are developed through a learning loop during various stages of the project as more information arises.	

Table 9.1f

Theme of results group:	*Implementation of the model will require a culture shift as it will affect all corners of the organisation*
· In order to implement the changes in project management philosophy it will involve a shift in the whole culture of the organisation · Managers may need training in commercial management skills to be able to understand the strategic issues concerned. · It is important that momentum is maintained to ensure that implementation occurs - many good ideas remain discussion points within BAA	

Table 9.1g

The interviews conducted during this phase of the research methodology did not specifically present the model. Instead issues were discussed in relation to the model characteristics in order to confirm or dispel elements of the model. These tables confirm many of the features of the strategic project management model developed and in that respect the model could be assumed to represent the thoughts of this sample.

The following list covers some of the points that were considered to bear relevance to the implementation of a model for the management of projects within a large client organisation:

- The interviews raised the question regarding the professional background of client project managers. A debate remained ongoing as to the level of commercial experience the project manager should have in balance to engineering experience.
- It appears there is a trend toward contracting out many of the traditional duties of the project manager, leaving the client PM to concentrate on the management of the project within the client organisation.
- Despite the commonly held view that contractors should have an earlier input to the project process, there still exists the opinion that the contractor will be solution driven.
- Whilst some of the interviewees considered the North American approach to construction to be superior to that found in the UK, there were those with experience in the United States who considered the differences to be less marked.
- It became apparent that the quality of site management amongst Japanese contractors varied significantly according to their size. The large general contractors were considered to display strict site control. However, the standard of site control was found to be lacking within the smaller contractors, where sites could often be left idle for days waiting for material or human resources.
- It also became clear that the attainment of value for money for the Japanese client was less important than maintaining long term relationships. The Japanese client is clearly motivated by different values to the UK client and the contractor is relied upon to a much greater degree.
- Building quality has been seen to fall below the acceptance levels in the strive for

cost reduction. It is clear that the achievement of value for money has often been based upon reducing the cost at the expense of quality. The client appears to go through a learning curve, continuing cost reduction measures until a project results that is clearly below acceptable quality level.

9.2 Results from the group discussion workshops conducted within BAA plc

Objectives: *To present the strategic project management model to a specific sector of people within the BAA plc organisation with the view to testing the philosophy and detail of the model. Also the participative nature of this workshop was designed to introduce concepts behind the model to influential members of the project organisation to open the action research.*

The data collection method chosen for this part of the research was selected to draw together project participants from within BAA plc in groups to actively participate in a workshop. Each business unit was represented by approximately ten members of staff selected by the researcher together with the primary contact. A list of the specific group members can be found in appendix 9; however, table 9.2 gives an indication of the type of participants that were included:

BAA sample	Example of workshop participants
Heathrow Airport Limited Gatwick Airport Limited Stansted Airport Limited Technical Services Division Scottish Airports Lyntons	Managing/Engineering Director Senior Project Manager Client representative Project Manager End user Contractor representative Maintenance Manager Senior management representative Finance / Cost Manager

Table 9.2 Indicative sample for BAA group discussion workshops

The purpose of performing a group discussion such as the workshop was to re enact the group dynamics that would take place during a project. In this way the intra organisational conflict sources would emerge and exposure to the model would be maximised. The results thus take on a number of characteristics:

- Those comments related directly to the model
- Those comments relating to the implementation of the model
- Those "soft" issues relating to the dynamics of the group and the resulting implications on the model.

The agenda for the workshop can be found within appendix E, highlighting the nature of the group discussion, encouraging challenges and questions.

The investigation at the BAA groups resulted in a number of general conclusions as well as specific problems with the model. These will each be addressed in turn. All groups found the model too mechanistic whilst at the same time welcoming it's structured nature. Resourcing was also a general area of concern but was dependent upon whether the model was perceived as a structure or as a philosophy. All of the workshops highlighted the complex issue of the definition of the client/customer/end user and in fact the project manager him/herself; also the relationship that resulted from these definitions was found to be of paramount importance to the scope definition of the project.

9.2.1 General conclusions from the airports

The following tables indicate the different approaches across the business units to the research workshops indicating specifically the sub cultures at each airport location, technical services and Lyntons. Tables 9.3a to 9.3f outline the general results from each of the workshops.

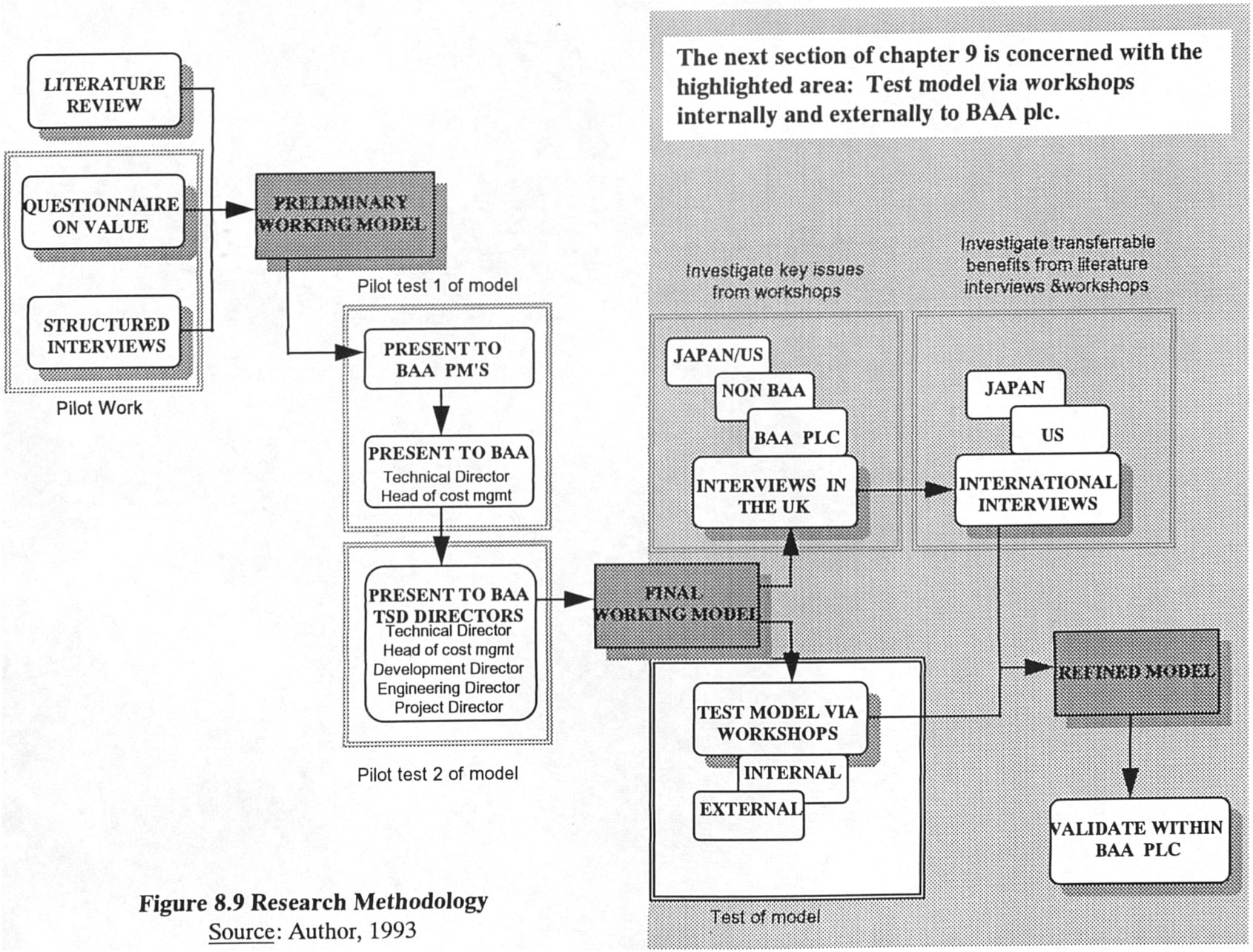


Figure 8.9 Research Methodology
Source: Author, 1993

Heathrow Airport Limited	Table 9.3a
Heathrow Airport was keen to learn from the exercise and challenged the model well. The group made it clear that the model reflected their current practice but in a structured manner. The definition of value and its constant reevaluation throughout the project was recognised as being beneficial. The group were clear on their intended way forward to meet the challenges of projects including the use of innovative procurement routes, standardisation and simplified specifications. Project ownership was high on HALs agenda and was therefore constantly referred to. The central projects group now facilitates the cross fertilisation of information that was lacking. It was inferred that Project managers are the "project runners" and did not feel that they had enough quality involvement in the early stages.	

Gatwick Airport Limited	Table 9.3b
Gatwick Airport was pleased to see the early involvement of the Project Manager in the strategic decisions and there were some strong feelings that this part of the model did not occur within BAA. There was a degree of resentment over the way initiatives have been implemented at the airport in the past. Ownership was again seen as important. The group identified with the value thread through the project life cycle and were keen to discuss the multi *client* value systems in play and the confusions and mixed messages that result. Culture change was deemed necessary to introduce the model. The group were also keen to see a model for small projects, whilst containing all the issues necessary, it was considered too cumbersome.	

Stansted Airport Limited	Table 9.3c
Stansted Airport did not appear to relate to the model as well as the other test centres. The main messages were the definition of client and the implications that has on the project outcome. It was made clear that the client for the Stansted development was not the final management team, whom it should have been. The group were pleased to have a framework into which all aspects of the project process slotted. They discussed quite thoroughly the changes of *value for money* with time and felt that no model could encompass this. This workshop focused on lessons from the Stansted project.	

Technical Services Division (now Group Technical Services) Table 9.3d
This workshop resulted in a different output than the other test centres due to the nature of the group and their apparent need to defend current practice. Some members of the group found it difficult to challenge the model objectively. However the workshop identified a number of new initiatives that were taking place within BAA which reflected areas of commonality with the model. The group identified well with the client versus multi value system but felt that the client value system was not as clean as the model presented. The value management process, current practice at the time of writing, was allied with the model and used to show that the model was "achieving no more than current practice". Development of the brief in iterative stages was found to be lacking in the model. Emphasis was placed on the management of construction projects and cost control but the close proximity to the development department allowed a more strategic stance. The researcher sensed a separate ethos between the development and Project management sections even though they were required to work closely together. The group appeared less concerned with the airport operational problems identified in other workshops and therefore must rely on the client for this input to the project. The group were keen to pull out very specific problems with the model. It was felt however that the powerful figures within this group led to a politically charged discussion where the research was seen as a threat and challenge of what was in use at the moment.

Scottish Airports Table 9.3e
The opposite to the TSD situation was seen at the Scottish airports workshop where the discussion was open and challenging. The group felt that the model provided structure and support to the systems currently in use. The strategic nature of the front end of the model was welcomed and the group felt that this was often lacking within BAA projects. It was clear that the nature of the projects within this part of BAA was different to previous test centres and this was reflected in the concern of the group over the applicability of the model to smaller projects. The definition of value and inclusion of aesthetics into the model pleased the group who were concerned over the *money scarcity values* currently in operation. A skills gap was discussed at project board level due to the issues that the model uncovered regarding the strategic and tactical interface. Some members of the group believed that the model would give better use of time rather than simply draining the time resource.

Lyntons	Table 9.3f
Lyntons workshop again was different to the others due to their culture being one seemingly of more commercial awareness. The Project managers were involved in projects from start to finish and they consider themselves to meet the client requirements rather than simply meeting the time, cost, quality considerations. The group appeared more able to identify with the early stages of the model than the other test centres. Due to the nature of speculative building, in which Lyntons have previously specialised, the term value seemed to have more meaning and was readily discussed. The size of this section of BAA also made communication easier and the style of the project managers was refreshing. They were keen to agree that the success of a project was reliant upon the skills of the Project Manager and that the model would only be implemented as well as the project manager facilitating it. Lyntons were concerned with the lack of milestones in the model and found their own PM manual to be more effective in this regard. Some members of the group felt the model was too easy ie. it did not consider the internal politics of a large organisation and of a large project; in a similar way the model did not bring out the people management issues.	

9.2.2 Specific implications for the strategic project management model

The full analysis of the workshops can be found within appendix E, split into the workshop groups. The following list identifies the main implications for the model from these results:

- The model structures the practice that is strived for within BAA at present.
- The model does not present the project manager with enough specific milestones. In addition there is a lack of feedback during the project.
- The philosophy behind the model, ie. bringing the project into line when still part of the business strategy, was welcomed but the project manager's involvement at these early stages was debateable. It was often stated that these "early stages were muddled through".
- BAA in general would welcome a model such as this for small works.
- The model provoked much discussion on the attainment of a value thread through the project and appears to cope fairly well with this issue.

- The group wished for a structure to ensure that every aspect of the project was considered, but found this model too mechanistic. However when analysing the results it was clear that there were specific points on which the groups wished for more information within the model, for example, strategic procurement issues. Procurement decisions were not made by the project board as they did not have the specific knowledge and experience necessary.
- The decision to build line was a cause for concern for most workshop participants either due to its position, terminology or simply its demarcation properties. This line, whilst remaining, must be redefined to be more flexible and permeable.
- It was clear from the discussions that any model is useless without the correct and appropriate project management skills and the team chemistry required to function in unison. It was apparent that the choice of Project Manager for each project was based on resources not on the project management skills and suitability.
- The model should facilitate BAA not only to highlight problems earlier but also to realise opportunities as they arise.
- The sensitive issue of how the original estimate or budget was established for each project was a cause of concern throughout the research. The relationship with the original estimate and the attainment of value for money was often discussed.
- It appears that project managers are receiving mixed and varied value messages from within the organisation.
- All workshops identified that the post project feedback was not taking place even though post project audits had been written for a number of projects. The closed loop of the model was therefore welcomed.
- A number of specific problems with the model as highlighted in Table 9.4 will be worked into a revised model by the researcher.

Rank	Conclusions from BAA workshops
1	Model does not address small works projects
2	Team chemistry and people issues need emphasising
3	Resourcing requirement high
4	Model too mechanistic
5	Model is bureaucratic
6	Mixed values within client organisation need emphasising
7	Iterative production of brief unclear
8	Changing values with time/personnel not clear in model
9	Will require a shift in culture
10	Unfeasible to involve PM in early stages
11	Time requirement to conduct model
12	Strategic procurement issues not stated
13	Model does not lay out clear milestones
14	Misleading to put design and construction together
15	Does not incorporate budget setting
16	Decision to build line in wrong place not flexible
17	Could confuse project with too many people
18	Model assumes all projects start as a problem
19	Environmental changes not considered in model
20	Does not highlight the primary/secondary values
21	Does not cater for sub projects within main project

Table 9.4 Specific model related issues highlighted in the group discussions

In addition to these results the workshops provided valid information regarding the "soft" project issues that would not arise from a questionnaire. These included the following:

- The workshops highlighted the complex issue of the definition of the client/customer/end user and in fact the Project Manager him/herself.
- Project scope definition was often neglected but is of paramount importance in defining roles.

- BAA plc rarely provides the PM with a sole definition of Value for Money for each specific project. The project manager often faces a number of value definitions, each in conflict.
- Power and Politics overrides any project management process. Within the workshops it became clear where the power lay and the interrelationships between departments. In addition the conflict of objectives between different internal departments led to heated discussions which surely must occur in projects.
- There is a competitive motivation within the Business Units, whereby each believes they are more sophisticated at Project Managing than their peers in other Business Units. Each were concerned to express their own expertise. Central pooling of knowledge was not apparent although under discussion.
- There was a good understanding of the problems during projects and the possible solutions. However the project managers felt that the policy makers were thrusting policy without understanding the difficulties of implementation. There was a sense of "oversupply of new initiatives".
- The participants with power within the group were found to be those who were driving the core business. Projects were considered to make their life difficult, whilst at the same time they put many demands on the project managers to meet their timescales for new developments.

9.3 External benchmarking workshops

Objectives: *To investigate the current practice in project management within a variety of client organisations conducting project exhibiting similar characteristics to BAA. This was in order to benchmark the model, BAA current practice and current practice within the chosen sample. Also to present the strategic project management model to these organisations to test for clarity and content.*

In order to increase the scope of the test it was decided to present the model outside of the sponsoring organisation, reducing the chances of narrow vision from only testing within BAA. For this reason the sample was increased to include six UK client organisations exhibiting similar features to BAA. The specific list of participants from each organisation may be found in appendix E. Table 9.5 classifies the organisational sample by organisation type, due to the need to maintain anonymity.

Code	Company Classification
A	International communications organisation
B	Private Water Company
C	International Airport
D	International Airline
E	National Supermarket Chain
F	International Fast Food Restaurants Chain

Table 9.5 Classification of the UK research stratified sample

Appendix E details the specific data from each group workshop regarding the model including:

- A summary of the project management process in each sample organisation
- A summary of the positive comments regarding the model
- A summary of the weak points in the model and actions to resolve them.

Table 9.6 below gives a brief resumé of the current practice in each of the sample companies indicating the similarity between the model and the project management processes in use.

Co.	Nature of projects	Comments/Characteristics	Similarity to model
A	Office, technological projects	Use of outside PM consultants, People management essential, Milestones and choice within their framework.	Similar without strategic and feedback stages
B	Engineering project with many stakeholders	Stakeholders conflicting objectives, Strategic level welcomed, Milestone management and feedback.	PM manual lays down all stages except early strategic stages.
C	Small airport projects, just completed significant, complex project	Shifting definition of value, Any PM process requires flexibility, Early stages often muddle into one.	No framework is in use, intend to base one on results from major project.
D	Multi different type and size of projects conducted internationally	Management of client body essential, Limitations of working under a landlord, Procurement considered throughout the project.	PM framework based on detailed approvals process.
E	Multi similar projects nationally	Difficulty relating to strategic level of research framework, PM runs with live project only, Corporate value versus project value? Building formula for multi similar projects so why challenge it?	PM framework in use as policy, based on tactical project management.
F	Multi similar project internationally	Strategic issues become generic, they possess a strong learning culture, standardisation and componentisation used throughout, client knows what he wants - formula, definition of customer very important.	PM methodology appears a cultural thing, cross communications high - no evidence of PM system in use.

Table 9.6 Summary of the characteristics identified during the UK group discussion workshops

The overall message from the workshops is that the majority of the organisations tested have all undergone significant changes in the project management sphere over the past two to five years. It is evident that they have all realised the importance of the customer and many are internally marketing their services within their own organisations. The spectrum of organisations tested revealed a good cross section of issues and a number of mechanisms for dealing with the problems that arise during the projects life cycle.

The following section will list the significant points that resulted from these discussions. Those that have been highlighted are areas from which BAA differ in their practice or those areas not discussed during the BAA workshops.

- Each of the external organisations were clear that the feedback loop at the end of the model was essential.
- The latter feedback stages were not conducted effectively in their own Project Management practice.
- Each of the organisations tested made use of milestones more significantly than appeared to be the case in the model.
- The introduction of the procurement debate early into the project lifecycle was welcomed in the model.
- *Interface management* was considered important by some of these organisations and the handover interface was found to be missing from the model.
- The model should have *bypass routes for fast track projects or those where the value definition is driven by time.*
- At least two of the organisations tested had either contracted out their project management process or were just about to. One of these was to form a *partnership with an external project management consultancy to manage the tactical project management.*
- Management by the project manager of his/her own client organisation was found of prime importance and a factor that proved most difficult within a large organisation. It was in this field that three of the organisations had introduced a

section to specifically manage the input of the client groups and to act as a filter for the stakeholder requirements.

- Most of the organisations felt that the model lacked people issues and therefore there arises a need for a people management overlay to the model.
- The structure provides commonality and assurance but takes away from the project manager his/her autonomy. It is hoped that the model will be amended to better reflect project manager autonomy.
- The original budget or estimate was again a point of concern for the groups who considered that the model did not address this.
- The use of *standard components and simplified specifications* has filtered through the majority of these organisations, resulting in amended specifications and innovative purchasing methods challenging the bespoke nature of past projects.
- Modular building is creeping in to the construction framework and two of these organisations have made *significant savings by complete modular build or partial modular build.*

Whilst there were many comments confirming the use of the model and the areas in which it's strengths lie, it is important to focus on those issues calling for development of the model. The comments arising from the workshops were vast and covered a large number of issues. However, in analysing the data within the appendix it is possible to group the comments requiring action and model development into six main themes, these have been tabulated in table 9.7:

Common theme:	**Issues within the theme group:**
People management and the interfaces therein must be emphasised and rationalised	People management must overlay the project process; interfaces require more definition; internal client management needs emphasising; danger of complicating with too many people with too much input; decision making will be subject to politics; formalisation may cause conflict; continuity of ownership required; need to define scope of PM, end user and client at start.
Model must recognise value as political, time & organisation dependent, and environmentally motivated.	Does not test values until project end; environmental constraints not considered; assumes definition of value should come from senior management; time dependency of value for money not considered; difficult to apply to multi similar buildings where value has become a "success formula"; difficult to convert commercial values into project terms.
Particular omissions regarding procurement.	Does not address contractual system; does not consider innovative procurement routes; needs to address the setting of budgets at the start of the model; presumptuous as to the resources and status of the PM; would not work for fast track projects.
The model requires more specific milestones to mark the end of one stage and the link to the next.	Requires more specific milestones; should be tied into the approvals procedure; model does not appear to facilitate change; rolling evaluation and looping may reduce precise decision making; need to feedback at each stage of the model; terminology of the "decision to build" line confusing.
Small projects management	The model must suit the nature and the size of the project; need bypass for small projects whilst maintaining all stages.
Implementation of the model will affect all parties to the process - requiring a cultural shift.	Problem with implementation as model is all pervasive; no choice available for the PM; neither a philosophy or a framework; time constraints will result in short cuts; not flexible enough; must be understood by all parties to the process.

Table 9.7 Themes developed through the discussion workshops

The soft issues arising during the workshops reflect those highlighted in section 9.2.

9.3.1 The airport project?

In an attempt to discover the uniqueness of airport projects the characteristics were assessed during the participative workshops. It became evident that the characteristics of airport projects were not particular to the airport industry and the non BAA sample took exception to the inference that airport project managers were exposed to more complexity. Table 9.8 sets out the characteristics highlighted in part one of the thesis and further developed during the research period. The table identifies the occurrence of these characteristics across the whole sample, in order to highlight areas of distinction.

Whilst these characteristics are experienced during the airport project they are clearly not exclusive to the airport industry. It would appear that they belong to a group of industries dealing with an ongoing operation adding complexity during development of the business through construction projects. Whilst the sample agreed that airport projects could experience these characteristics, no difference was highlighted during the construction phase of the project. The process was considered to be identical regardless of the industry type; the difficulties arose due to the significant number of stakeholders and the need to maintain the operation of the business in a safe and secure environment.

In all cases the nature of the customer was shifting as the customer becomes more aware of their needs and the need to fully understand the customer and stakeholder requirement was echoed in all the groups. Added complexities were highlighted for company D, the airline, who considered the airport authorities, with whom they work, to misunderstand the nature of their business and thus cause barriers to the achievement of value during projects. Dealing openly and honestly with this *landlord* was stated as being "very difficult".

Characteristic of airport project	Experienced in BAA projects	Experienced in samples' projects
Regulation sets standards to which projects must conform	Sometimes	B,C,D,E,F
Night working due to 18 hour+ operation	Sometimes	B,C,D *
Locational constraints on space	Sometimes	*
Significant number of stakeholders	Yes	B,C,D
Changing nature of stakeholders' business	Yes	B,C,D
Projects often reacting to customer request	Yes	A,C
Constant throughput of people during construction	Sometimes	B,C,E *
Working with existing assets much of the time	Yes	C,D *
Project takes second place to operation of business	Yes	A,B,C,D,E,F
Many sub project types within one project	Yes	B,C *
Requirement for speed emphasised due to operational disruption during construction	Yes	B,C,D,E
Administration for security at site location	Yes	B,C,D
Projects must be designed to grow with demand	Sometimes	C,D
Nature of end user shifting - rising expectations	Yes	B,C,D,E
Projects exposed to high environmental profile	Sometimes	B,C,D
Facility can serve no other purpose if abandoned	Sometimes	B,C

Table 9.8 Characteristics of an airport project and their occurrence in other industries * Experienced sometimes depending upon the project.

It was also clear that, whilst these conditions *could* be experienced on airport projects taking place within the live environment of the airfield, there were projects occurring in a green field environment or in areas remote from the direct throughput of passengers. Thus not all of these characteristics apply to every airport project.

9.4 North American benchmarking interviews

Objectives: *To investigate the Project Management systems in use in the US, with a view to incorporating any useful features into the research framework. To understand the US client decision making process and the interpretation of value for money for a North American client organisation.*

Due to the time limitation in the US and the need for planning, it was decided that the workshop format would not be appropriate. Therefore the structured interview was selected as the most efficient and effective way to gather information regarding a diverse range of issues. The interview questionnaire was prepared prior to the US visit and was sent to each participant such that any necessary preparations could be made. Appendix F contains the following information:

- The interview questionnaire template
- A summary of the principal points from each interview
- The template used to collect significant information during the interview

Table 9.9 classifies the organisations according to their core business and location in order to maintain anonymity. The figure indicated beside some of the sample is the construction spend per annum; this has been included where supplied upon request. In each of the sample organisations, one or two senior managers were interviewed.

The interviews were structured, but where necessary the interviewees were encouraged to develop their answers and add supplementary questions where appropriate.

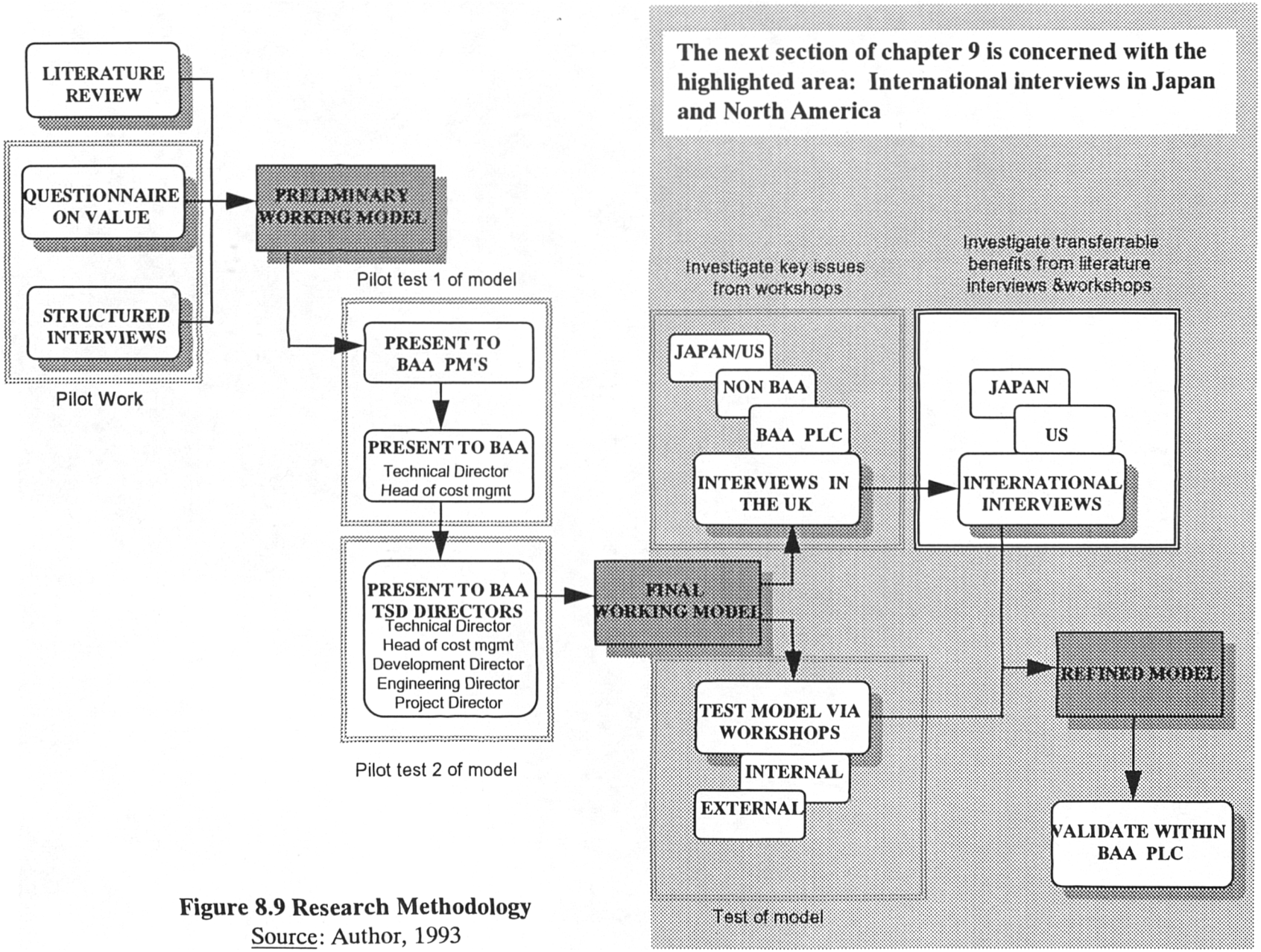


Figure 8.9 Research Methodology
Source: Author, 1993

Code	Company Classification	Location
G	Expatriate for UK QS Firm	New York
H	National Communications Company ($640m)	New York
I	International Communications Company ($489m)	New Jersey
J	Global Document Processing Company ($130m)	New Jersey
K	US Hub airport	Pittsburgh
L	Value Management Consultancy	Chicago
M	City Department of Transport	Chicago
N	Construction Manager for International Airport ($1.7bn single project)	Chicago
O	Construction Manager for Hospital Development ($140m)	Chicago
P	International Airline (400 projects/year)	Chicago
Q	International Airline	Dallas

Table 9.9 US sample Organisations classified according to activity

Due to the diverse range of issues arising from the interviews, it is difficult to form groups and themes to simplify the presentation. The following information summarises the data collected during the US research period in point form:

- The PM branches of three of the sample are actively marketing their services internally. They are seen as service departments and operate as such. The PM and client may also sign a contract for the production of the briefing/program document.
- PM guidelines are available at all of the sample companies, many in their infancy.
- All parties were clear that the early involvement of the PM added value to the planning process.
- Most of the sample believed that the PMs role started with the establishment of the user needs and from first principals and consolidating this with the business strategy of the organisation. There were numerous examples of sophisticated preconcept documents produced by the PM group.

- The PM considered themselves to have a fairly high degree of delegated authority. The more sophisticated the predesign document then the more decision making was left in the hands of the PM.
- Ownership of the project varied across:
  - -Client ownership
  - -Joint client/PM ownership
  - -PM ownership and responsibility
- It was common amongst the sample to recognise the main cause of project difficulties to lay within the client organisation due to a number of reasons:
  - -Complexity of project team established for the project decision making
  - -Political activity within the client organisation
  - -Political influence from outwith the client organisation
  - -Decision making by committee
  - -Huge number of user groups to coordinate (112 in one case)
- The client's knowledge of the construction process was recognised as an issue for the PM, and support was seen more fully when the client representative was "educated".
- One organisation was seen to be conducting Strategic PM at corporate level and offering this as a service to the internal departments. The others were aware of the link between their management of projects and the achievement of the corporate strategy.
- Only two of the sample were utilising a structured VM program, the remainder were using the Value Engineering philosophy of seeking cheaper alternatives as and when it was necessary to reduce the cost.
- A variety of methods were used to establish a definition of client Value for Money:
  - -Statement of need from the client
  - -Prioritised list of concepts, goals, level of finish etc.
  - -List of client expectations
  - -Cultural interpretation by the PM of the required level of quality
  - -Corporate Value plan
  - -All members of the sample referred to the need for a "World Class facility"

- The term Value for Money was often related directly to the Internal Rate of Return of the project.
- Value for money was described as being subjective like art; also Value for Money was recognised as being a shifting dimension with the economy and what was Value for Money at the start of the project is not by the completion date.
- Team vision and motivation at site level is a concern not readily addressed, however one of the sample had huge success by setting up an information centre on site through which all site personnel must pass before commencing their contract.
- Budgets were established in a number of cases from experiential understanding of similar project.
- There were many examples of methods to manage the design process:
  - -Architect redesign at his own cost
  - -"Drop dead" schedules for architect, ie failure to meet these schedules results in contract termination
  - -Decision schedules for the client to meet to stay within program
  - -Decision tracking and change management
- Most of the sample use a small number of known contractors, often appearing on lists established form past project feedback. The prequalification of contractors was sophisticated and was seen as their guarantee that the contractor would achieve value for money for the client.
- Affiliations with important groups of construction aware persons were seen to add immense value to the review process of projects:
  - -Blue Ribbon Group
  - -Business Round Table
- One of the sample was operating as a process broker, finding the best organisation to conduct each element of the project and managing it on a strategic basis.
- Airport projects were recognised as being both political and complex, belonging to a group of projects required to take place within an existing operation.
- The US sample were enthusiastic about their role and were pleased to discuss both their successes and their failures openly. The public authority department interviewed were more guarded and showed less confidence and enthusiasm.

In summary therefore the results from this interview sample indicate that the North American client project manager has a higher input early in the project and towards the close of the project. It is during this stage that the project scope is defined, roles established and communications set up. The effort spent in planning the project and setting up these communication networks results in a better understanding by all the project members of the requirements of the client. The efforts required in controlling value for money during project implementation are considered less due to the common goals and pre selection that was established early in the project. Graph 9.1 simply represents the project management input during each of the project stages in the UK and North America. Whilst the sample was too small to generate any valid data, the graph gives at best an indication of the comparable effort expended. The graphs can be seen to follow the same shape with reduced input during the early and late stages of the project. However, it would appear that the US project manager spends more time in the preconcept stage planning the project with the business managers, defining the scope of the project and ensuring strategic fit.

It can be inferred from this discussion that the North American approach to the construction process offers a number of benchmarks to the UK client organisation. Figure 9.1 outlines the significant areas for development of the model.

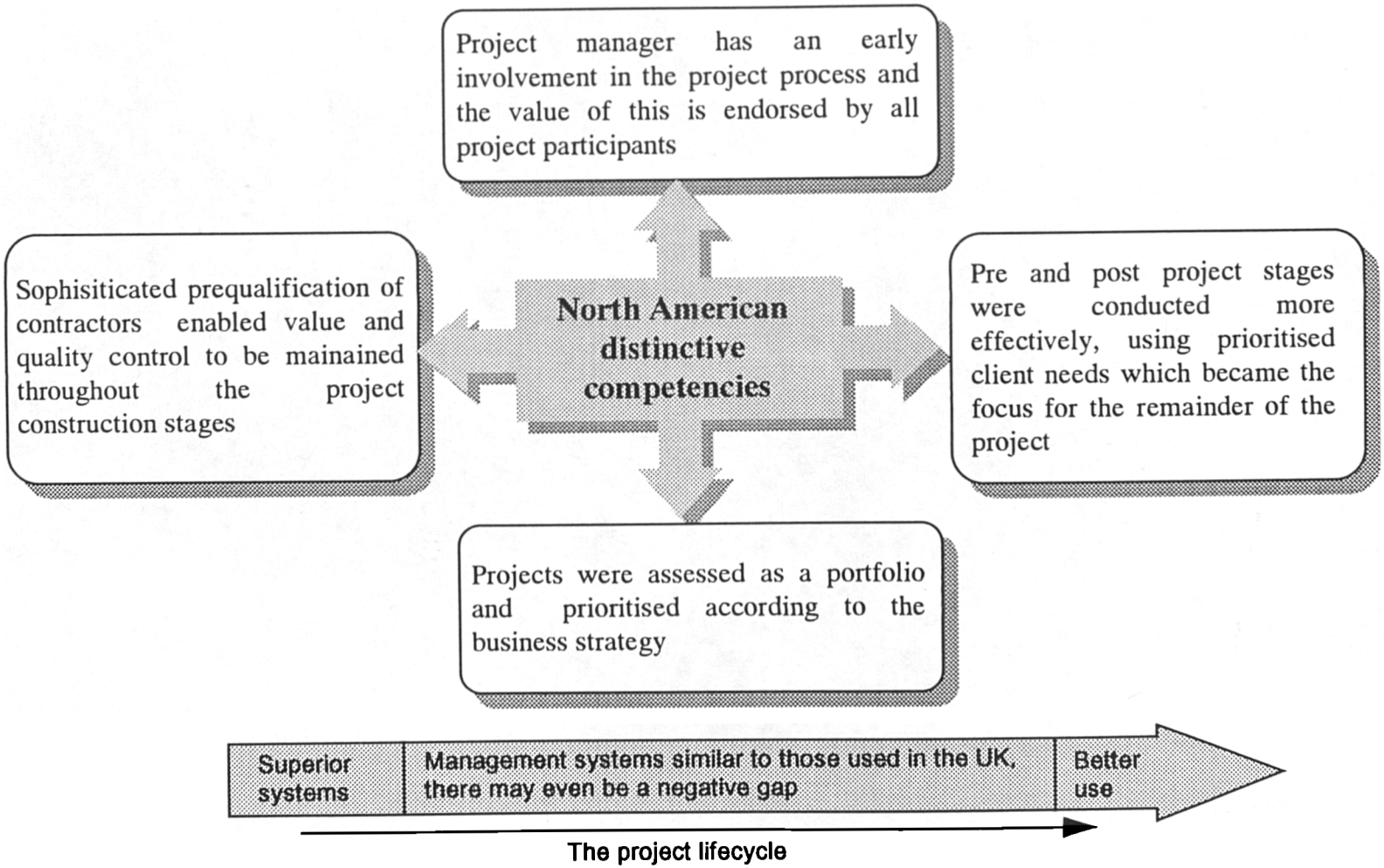
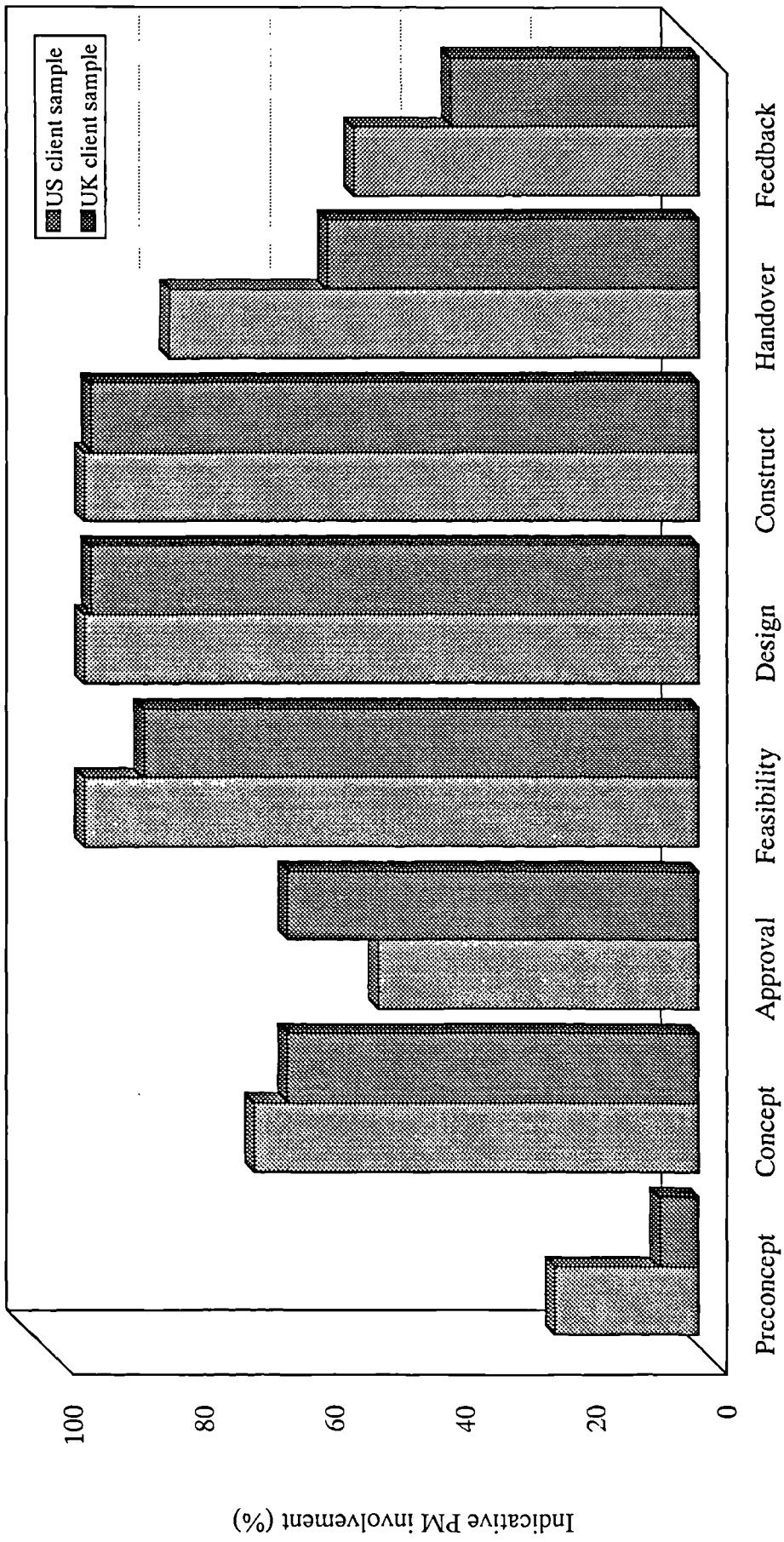


Figure 9.1 The learning gaps idenitified between the UK and North America Source: Author 1994



Involvement of Project Manager during project stages
Graph 9.1

9.5 Japanese benchmarking interviews

Objectives: *To investigate the construction culture in Japan, paying particular attention to the planning and strategic function conducted by the Japanese client organisation, with a view to translating analytical and human relations advances into the research framework.*

In order to meet this objective, the Japanese Construction Industry were approached from the UK. The UK offices were utilised to make a formal introduction. In this way the Japanese organisation can be accessed at the appropriate level with the respect demanded within their culture. After initial investigation it became clear that the client organisations somewhat relied on the major contractors, commonly known as "The big six", and were keen to push the research questions to them. The final sample consisted of a mixture of client and contracting organisations. It was made clear to the delegates that the research required international experience from their perspective such that a fair appraisal of the UK versus Japanese Construction Industry could be made.

The questionnaires sent to the delegates were based on those used for the US sample to maintain consistency, however the language was amended to simplify the questions. In addition a second questionnaire was written for the contracting organisations taking a slightly different approach by questioning the contractor on his perception of the Japanese Client and comparisons to the UK system.

The final sample is classified in table 9.10 indicating the area of Japan and the nature of the core business. The delegates provided by these organisations varied from 2 to 6 at each location and were of a senior level, with various degrees of experience outside of Japan. Appendix F contains the following information:

- A list of the participants to the interviews
- The interview questionnaire template
- A summary of the principal points from each interview

Code	Company Classification	Location
R	Large General Contractor	Tokyo
S	Expatriate for a UK International QS firm	Tokyo
T	Large General Contractor	Tokyo
U	Japanese Global Car Manufacturer	Nagoya
V	International Communications company	Osaka
W	Private company building a new airport	Osaka
X	Large General Contractor	Osaka

Table 9.10 Japanese sample organisations classified according to function

Before the results for this section are presented the researcher wishes to qualify the results to account for the research errors that are inevitable across such a cultural barrier. The researcher as much as possible adapted to fit the Japanese ethics culture but there were situations whereby the interviewee did not understand the nature of the question.

In many cases it was evident that the interviewee understood the question but was not prepared to answer, the nature of the culture however is that the interviewee will give a response regardless, which therefore maybe somewhat misleading.

However the researcher has tried to consolidate the results presenting only those which are backed by evidence from a number of sources. Thus the following conclusions may be drawn from the interviews:

- There appears to be a contradiction between the power base in construction projects with both the client and the large General Contractors claiming that the power and control is in their hands. Conversations with third parties suggests that the General Contractors have a huge degree of power and political support in the construction industry.

- The construction process in Japan is not directly comparable with that in Europe as the philosophy and culture of the people is totally at dipoles with the contractual base within Europe. However there are some comparisons to be drawn.
- The Japanese system seems to be on the verge of change, as there is general dissatisfaction with areas such as cost control and ability to compete outside of Japan.
- Land cost makes up approximately 90% of the cost of building in Tokyo, therefore the incentive to reduce construction cost is minimal. A 10% saving on construction cost has very little impact on the overall cost of building.
- The Japanese client is described by the General Contractors as being uneducated, however they have huge technical divisions with resources for managing their own projects.
- The Project Managers consulted did not understand the concept of the internal client and single points of contact within the client organisation appear non existent.
- The long term relationship between client and contractor is both advantageous and disadvantageous, especially for the contractor organisations who regularly must absorb losses to satisfy the client in the hope for future work.
- The contractors interviewed were aware of the advantages and the need to become more contractually aware. It was believed that a mix of the Japanese human relations and the Western contractual awareness would work well in Japan, but would need a total effort in Europe to succeed.
- Most of the projects are based on a guaranteed maximum price over which the contractor will not stray. This raises questions as to the level of contingency put into the contract.
- Conflicting views exist over the quality of site practice and productivity levels. It appears that there are a minority of very efficient site workers and many inefficient site workers. The sites visited during the research trip were very tidy and clean although there appeared to be few people on site.
- The relationship between the client and the General Contractor is described as "a wet relationship", the maintenance of which is very important. That is a fluid, volatile relationship, with no set barrier between the two parties. The activities of

the construction industry depend wholly on this.

- The planning process is indeed long and "meandering", starting many years before the commencement of a project real. However the research did not provide enough quality information to establish the efficiency and effectiveness of this planning period. There were numerous cases discussed during the research period of projects now running late and over budget that had undergone years of planning.
- Project stakeholder issues were not perceived as strong due to the passive culture of the people and due to the Design and Build method of procurement regularly utilised.
- Japanese corporate businesses are becoming subjected to recession led actions, and the organisations are being thinned down to make way for a leaner operation. Change is not easily taken in Japan and this new direction for Japanese organisations has set the scene for a period of flux which felt apparent during the research period.
- The definition of Japanese "construction philosophy" varied from the traditional "time cost quality" to "mutual trust, interrelationship between design and construction, leadership". During the discussions it became clear that the latter philosophy underpinned the time cost quality achievement.
- Value for Money is not readily understood as a term and there appears to be little hard evidence that the contractor seeks out the "needs" of the client at the start of the project. However, the nature of the long term relationships ensures early involvement of the contractor in the clients project planning stage. The brief evolves with the project.

In summary of these issues, a number of learning points may be identified for the model development. These have been schematically represented in figure 9.2

Figure 9.2 The learning gaps identified between Japan and the UK Source: Author 1994

9.6 Small projects workshop

As a result of the workshops conducted regarding the management of major projects it was found necessary to produce a model for the strategic management of small projects. This section therefore documents the results from an additional participative workshop conducted in response to the main research results. Table 9.11 classifies the construction spend across the projects at London's Heathrow Airport indicating that the spend on small projects in one year reaches £25.2m. This significant spend receives far less attention than the major projects.

Project characteristic	Annual spend	Subtotal
Major projects (120 no.) ≥£100,000	£133m -£17m (central reduction)	£116m
Small projects (65 no.) ≤£100,000≥£50,000	£4.45m	£25.2m
Small projects (75 no.) ≤£50,000	£1.76m	
Major maintenance	£5m	
Revenue works	£4m	
Normal maintenance	£10m	

The participants for this workshop were drawn from within the BAA organisation, selected such that half of the research sample represented major projects and the other half represented small projects management. The sample took one member from each business unit. The agenda for the workshop was set to allow the researcher to conclude the differences between small projects management and major projects management. Table 9.12 draws the main conclusions regarding the management of small projects within BAA.

Small projects workshop.	July 1993
· Defined as projects less than £100,000 cost · Easier to define the start of a small project · Planning less regimented · Reason for small projects can be long term or short term maintenance or as part of the major projects process · Consequences of a small project going wrong can be as problematic and as far reaching as a major project · Small projects do not currently have a brief due to time constraints, therefore specification hard to finalise · Payback periods often shorter · Less complicated procurement - more scope for central procurement · "Just get it done" attitude towards cost · Contractors and projects are expected to work round the clock to complete on time and with minimal operational impact · Duration shorter · End user normally specific · Often use same contractors on long term contract, with unit rates · Reporting system less defined · Approval process less complex and easier to achieve through the client · Common site supervision across a number of projects · Work less varied in a single project but project manager may have to coordinate several trade contractors him / herself. · Each project manager simultaneously managing a portfolio of projects · Requirement for flexible contracts · Clients uneducated in construction matters · Changes and variations inevitable · Proportionately the project manager is involved more in specific elements of the project · Less accountability · Political influences may be as intensive as major projects · Deluge of work at the end of the financial year · Value management and value engineering not conducted	

Table 9.12 The significant conclusions from the small projects workshop

9.7 Action Research within BAA

The data collection was enveloped within the action research methodology for reasons highlighted in chapter 8. In order to chart the impact of the research upon the sponsoring organisation it was necessary to record the main events believed to be influenced by intervention of the research. This section will outline the main influences and corresponding events that took place over the period of the research, suggesting the gradual assimilation of research conclusions and the subsequent model.

The tables below present three types of information drawn from the action research:

- List of reports submitted to, and interventions performed within, the sponsoring organisation and the events believed to have been effected (Table 9.13).
- A diary indicating the shift in attitude of the sponsoring organisation toward the researcher and the research content as time progressed (Table 9.14).
- A list of the working groups, workshops and seminars to which the researcher was asked to contribute (Table 9.15).

9.7.1 List of reports submitted to the sponsor

Whilst the researcher was given little direct feedback from these reports, it became clear that many of the ideas and the main body of the research had become accepted within the sponsoring organisation. This was indicated through the appearance of direct quotes from the model within organisational documents and presentations regarding project process improvements. In this regard the project process within BAA plc developed with the research by direct intervention within the organisation and gradual exposure to the research foundations.

However, it is recognised that the organisation was embarking upon many other forms of research and the project process was under development throughout, and prior to, the action research. It is difficult therefore to make a direct correlation between the events that took place within BAA and the action research other than those, for example, using the same terminology. It is only these that have been highlighted within table 9.13.

Date	*Report submitted to sponsor*	**Events occurring as a result of the intervention**
June 1992	*1.BAA plc Value Management techniques, Research period one, May 1992*	·No definitive effect but could be argued to have assisted the natural development of value management within the sponsoring organisation
July 1992	*2.Terminal 1 Value Management study, 23-24 July 1992, A critique*	·The researcher was requested to produce this critique document following submission of the previous report
Sep 1992	*3.Strategic procurement of projects utilising value management - The way forward*	·Value engineering guidelines produced soon after emphasising the same "value philosophy" message as this report. ·BAA promoted as a learning organisation at a senior managers seminar by Technical Services Director. This was a major conclusion in report.
Dec 1992	*4.BAA plc project value, October 1992 Questionnaire survey*	·Head of Value management requested that this document was not released within BAA
Mar 1993	*5.Workshop notes: BAA research study, strategic project management*	·Stages identified in the model were used to form the basis of a presentation to all TSD staff by Development Director ·BAA Project Management guidelines issued in Sep 1993 contained the model stages and many of the critical success factors highlighted in the model. ·Strategic tactical delineation adopted in discussions of the BAA project process.
June 1993	*6.Strategic management of projects to enhance value for money, Research Workshop results*	

Table 9.13 Action research through reports

Oct 1993	*7.Strategic management of projects to enhance value for money, results from an investigative study of the UK, US and Japanese construction industries*	·Development Director requested use of the model for presentation to the board of Directors. The presentation was concerned with the improvements in the project process taking place within BAA. ·Researcher invited to join an industry benchmarking task force ·Strategic project management model information used during a workshop to develop measures of project progress at each of the project stages.
Jan 1994	*8.List of tasks to be completed at each stage of the project process List of the minimum contents of each iteration of the project brief document*	·Contents of the iterations to the project brief used by the Development Director to develop the project briefing guideline for the Development and Project Management guideline. ·Project stages become BAA policy and the task checklists used to produce a standard Construction Management contract detailing the required tasks by each party to the project.

Table 9.13 Action research through reports

9.7.2 Perceived shift in attitude to research

During the period of the research the attitude toward the research project went through a number of shifts from the initial enthusiasm to disinterest and defensive actions. The attitude went through a swing towards the end of the research period as the results reached acceptance and the organisation's thoughts came alongside the research conclusions. Table 9.14 follows the organisation's actions as perceived by the researcher indicating these swings in attitude.

Date	Diary of events	Report
Jan 92	Significant profile behind the PhD study driven by requirements for action from the chief executive	
Mar 92	Embark upon research under Cost Management section (CM). Following which the head of CM loses role in project development, research immediately sits uncomfortably within CM. No brief received.	
Mar 92	Other university form link with sponsor set to deliver similar results to those held within brief for PhD. This has a numbing effect upon the profile of the PhD study.	
May 92	It is suggested that the researcher joins the other university team to assist in their research. No brief received.	
May 92	Chief executive announced that time would be given at the start of projects to allow full planning.	Report 1
June 92	Asked to attend series of VM workshops. In an attempt to receive brief researcher set meeting with Technical Services Director to find out the objectives of the study - meeting cancelled.	
July 92	Head of Value Management stated he would like to work together upon development of Value Management	Report 2
July 92	Airport management concerned over exclusivity of research to Technical Services Division and try to gain control of PhD study	
Sep 92	TSD trying to establish role for the future within BAA; request involvement of researcher in global project management issues.	Report 3
Nov 92	Message from CEO: Plan projects thoroughly, design management and only build what is needed.	
Feb 93	Researcher requested not to issue information further than herself when concerned with Value Management	Report 4

Table 9.14 Diary of events within sponsoring organisation marking a shift in attitude toward the research.

Date	Diary of events	Report
Mar 93	Meeting requested with Development Director to ensure that the information to be presented in workshops does not contradict any information from his department. Director of TSD recognises the lack os support for research and places his name behind research to add profile.	Report 5
Mar 93	Positive reaction from the airports regarding research conclusions during participative workshops. Defensive reaction from Technical Services Division marking the turning point in attitude toward the research project.	
Mar 93	Meeting with CEO with request for further meeting once research conclusions have been analysed.	
June 93	Airport management requesting feedback from the research	Report 6
Aug 93	Research moved under Development Director to ensure a consistent approach to the many forms of research ongoing.	
Sep 93	Researcher requested by airport management to provide information on research conclusions to the airports directly. Meeting requested by Director of Technical Services to discuss the results from the international benchmarking exercise.	
Oct 93	*Development and Project Management Guidelines* issued within BAA containing elements of the research model. Requested to join a number of taskforces and working groups as detailed in table 9.15.	Report 7
Jan 94	Project Services Director adopts strategic project management model for basis of project management vision to be transmitted to the project organisation	
Feb 94	Researcher requested to join full time task force for the implementation of improvements to the project process within BAA as a two year venture.	
June 94	Strategic project management seminar presented as the theme for the project management seminar for all BAA senior managers.	
July 94	Researcher requested to coordinate World benchmarking study being conducted by Reading University for BAA.	

Table 9.14 Diary of events within sponsoring organisation marking a shift in attitude toward the research.

It can be seen from this diary of events that the sponsoring organisation went through a progressive shift in attitude toward the research. The original momentum behind the research wore off rapidly following which elements of the organisation became defensive over the techniques in use and under observation by the researcher. It was at the half way stage when the action research began to take effect and the organisation adopted some of the research conclusions that the organisation began to shift in attitude. The final stages of the research became mutual and cohesive as the organisation took advantage of the model as it became engulfed within the "new" project process resulting from the *Development and Project Management guidelines*. In the final stages of the research period the researcher joined a full time task force to implement the model within the sponsoring organisation.

During this shift in attitude the researcher was requested to participate in the development of the project process within the sponsoring organisation by joining a number of taskforces and working groups. The final table briefly describes the areas in which the researcher became involved over a period of time.

9.7.3 Working groups attended by the researcher

This table indicates the acceptance the researcher has gained from within the sponsoring organisation during the development of the strategic project management model. The action research has allowed the organisation to react to the findings of the research. Indeed the work of the taskforce could be considered to continue the action research started during the PhD study.

Researchers input	Description
Value Management workshops	The researcher was requested to be an observer in one and a participant in four VM workshops.
Procurement seminar	Attendance at organisation wide seminar to discuss the future development of procurement within the sponsoring organisation.
FORCE research team	Involvement in the work of a team of academic staff investigating the airport organisation as a business enterprise.
Industrial benchmarking taskforce	This team (a mix of managers from within BAA and the Warwick Manufacturing Group) formed to benchmark the manufacturing industry against the construction industry in order to improve the project process and learn from the new product development expertise of the manufacturing industry.
Project process measurement continuous improvement group	This group were formed to address the issue of measuring the success of the project as it developed through its stages. This was based on the view that it is too late to judge success at the end of the project.
Presentation to the Group Technical Services (GTS) board of directors	The researcher was asked to present the results from her research period to the board of directors of GTS. This was also used as a final validation of the model.
Project process improvement taskforce	This group developed out of the industrial benchmarking investigation and aims to implement improvements in the process of managing projects across the organisation. This will be achieved by working with the business units. This will be continued at the "end" of the research period.
"Building our Future" conference	The researcher was made jointly responsible for the conference held for BAA senior management regarding the future of project management within BAA. During this conference, of which there will be a further five to cover all senior management, the research model was introduced.

Table 9.15 Working groups and task forces joined by the researcher

9.8 Summary

This chapter has presented the results from a period of interactive holistic research, combining a number of data collection methods in order to generate themes for the development of the strategic project management model. The results were presented sequentially for clarity but combine to form areas of commonality. This summary will draw together the results from each method of data collection in order to highlight the areas requiring attention in order to develop the model.

These were drawn from the following data collection methods:

- Structured interviews
- Participative workshops within BAA plc
- Participative workshops within a sample of client organisations in the UK
- Benchmarking interviews in North America
- Benchmarking interviews in Japan

This chapter has presented the results from each of these data collection methods and formed them into common groups where appropriate.

The results from the structured interviews highlighted the following issues:

- Human issues should surround any project management process as it is fundamentally concerned with the integration of activities and people to achieve a goal.
- The model should streamline the client decision making process to ensure clarity, common goals and timely response to problems.
- The activities conducted at strategic level should be centred around improving links between organisational and process interfaces
- The model must be flexible enough to deal with real life projects constrained by time, finance or of a small size.
- Control mechanisms should be established to maximise the value to the project
- Feedback should be built into all stages of the model to ensure the project is aligned with changes in the environment.

- Implementation of the model will require a culture shift as it will affect all corners of the organisation

The participative workshops fulfilled a number of objectives by generating comments directly related to the model; by allowing the project management processes to be benchmarked in order to highlight best practice in particular areas; and finally by bringing together the central figures in the project management process, the workshops highlighted the softer issues relating to team dynamics during a project. The results from these workshops, whilst being voluminous, form common areas of concern amongst the participants. These are presented in this chapter as:

- People management and the interfaces therein must be emphasised and rationalised
- Model must recognise value as political, time & organisation dependent, and environmentally motivated.
- Particular omissions regarding procurement must be filled
- The model requires more specific milestones to mark the end of one stage and the link to the next.
- A model for small projects management is required
- Implementation of the model will affect all parties to the process - requiring a cultural shift.

The results of the interviews and workshops have been consolidated into a table of concerns requiring action in order to improve the model (see table 9.16).

No.	Common areas for model development
1	Human issues should surround the project management process
2	Decision making must be streamlined and rationalised so as not to complicate the process
3	The model must recognise value as political, time and organisation dependent, and environmentally motivated
4	Control mechanisms must be established to maximise value across the project
5	The model must be flexible enough to deal with real life project of various sizes and constraints
6	More use should be made of feedback within the model
7	Implementation will require involvement from all parties to the project process

Table 9.16 Common areas for model development for use in chapter 10

The international benchmarking interviews identified strengths in both North America and Japan, from which a UK client could learn. It was concluded that the North American client project manager invests much more time and effort in the early stages of the project. The scope is defined, the customer requirement interrogated and challenged, clear documentation is produced and communication paths established at an early stage. It is found that this effort in the early project stages reduces the complexities and uncertainties evident in so many projects once into implementation. Best practice identified during these benchmarking interviews leads to the following distinctive competencies:

- The project manager has an early involvement and the value of this is endorsed by all project participants
- Pre and post project stages are conducted more effectively, using prioritised client needs which become a focus for the remainder of the project
- Projects are assessed as a portfolio and prioritised according to the business strategy

- Sophisticated pre qualification of contractors enables value and quality to be maintained throughout the project construction stages.

It was concluded from the Japanese interviews that the cultural background of the Japanese business culture impacts directly upon the construction culture. The commonly reported long term relationships established between the client and contractors, with their associated benefits, are accompanied by a careful balance of power between the two parties. The benefits of the shared risk and full communications could be used advantageously in the UK but will require a culture shift throughout the construction industry. Value for money does not appear to take high priority in the Japanese client organisation.

The action research methodology utilised lead to acceptance of the holistic concept of the model and elements of the model have been implemented through various channel within the sponsoring organisation. Commitment to the model development has been shown by the sponsor in setting up a task force of company managers to ensure its implementation into the organisation over the next two years.

In conclusion, the model was considered to be advantageous within all the samples, with the common agreement that strategic and human issues are not given enough consideration during the management of a project. Whilst the model was considered of great benefit a number of comments were generated through interview and discussion in order to improve the model. This chapter has highlighted the concerns and comments regarding the model from a sample of experts in the field of project management.

The next chapter will consolidate these results in developing the model to reflect the concerns of the sample. The results reported in this summary will be used as a base for structuring the next chapter by generating responses to each results category.

10 INTRODUCTION

The previous chapter set out the results from each of the interacting research methods: structured interviews in the UK with BAA staff and those from outwith BAA; participative group discussion workshops in the six BAA business units; participative group discussion workshops in six corporate organisations within the UK; structured benchmarking interviews in North America; structured benchmarking interviews in Japan. In addition to these results chapter 9 reported upon the action research experienced during the research methodology.

Chapter 10 will analyse these results placing them within categories for ease of discussion in order to develop the Strategic Project Management framework. The discussion will address:

- the enhancements to the model to include the omissions identified in the results;
- amendments to reflect problems the sample had relating the preliminary model to real life projects;
- the most suitable format for it's presentation and delivery;
- the skills required.

In addition to the strategic project management framework for major projects, an amended model will be produced for the strategic management of small projects.

The discussion will benchmark:

- the North American and Japanese methods of project management in order to transport useful elements into this Strategic Project Management framework;
- a selection of UK client organisations who regularly procure construction projects;
- the airport business units to identify the mismatches between the current methods of project management cross the BAA group. In doing so the difficulties in implementing a new method of project management will be identified and an implementation plan suggested.

Chapter 10 will also discuss the nature of airport projects to confirm whether the airport project manager has particular difficulties above those of other industries. The suitability

of the strategic project management model to other industries will therefore be addressed.

In conclusion the chapter will present a summary of the final Strategic Project Management framework as a product for use by the sponsoring organisation by collating the information from the discussion. This will identify the processes that flow across a project and the issues that overlay it's management.

The chapter will be presented in seven main sections:

- A discussion building up the new amended strategic project management model based upon the benchmarking exercises (section 10.1)
- Ensuring a value thread through the project process (section 10.2)
- The realisation of interacting sub processes flowing across a project (section 10.3)
- The management of people through the project management framework (section 10.4)
- Implementation of the model into BAA plc (section 10.5)
- A suggested model for the strategic management of small projects (section 10.6)

The results chapter presented the comments as discussed within the group workshops. The grounded theory approach to the data analysis necessitated grouping these comments as the data collection progressed. The conclusions to chapter 9 tabulate the main issues for development in response to the comments made during the research period.

The following sections will address each one of the results categories individually in order to build up a refined version of the model developed from a practical perspective within the sample client organisations. These categories were:

- Human issues should surround the project management process
- Streamline and rationalise decision making
- Recognise value as political, time and organisation dependent
- Establish control mechanisms to maximise value
- Remain flexible to deal with real life projects of various sizes and constraints
- Use feedback more thoroughly within model
- Involve all parties during the implementation process

The discussion will argue the developments required in order to build the model reflecting the concerns of the sample. The discussion is split according to the categories presented above. For clarity and ease of use the final model: "Strategic Project Management framework to enhance value for money for BAA plc", has been reproduced in chapter 11. Chapter 11 presents in full the Strategic Project Management framework consisting of detailed information referred to in this chapter (chapter 10). It may therefore be necessary to refer ahead to chapter 11 to seek additional information. Chapter 10 and 11 have been arranged in this way in order to clarify the discussion and allow the strategic project management framework to stand alone for use by the project managers of BAA plc, in the absence of the thesis.

10.1 Ensuring clarity

This section is concerned with the points in table 10.1 below. The following statement summarises the main points responding to the issues in the results category:

Add decision points and more specific checklist milestones for the project manager. Amend the model presentation and terminology to simplify

The participative workshops, in which the preliminary model was presented directly to the group, revealed a number of specific amendments necessary to refine the original presentation of the strategic project management framework.

Results category: *Table 10.1* *2. Decision making must be streamlined and rationalised* *6. More use should be made of feedback within the model*	**Responding actions to develop model:** Add decision points and more specific checklist milestones for the project manager. Amend the model presentation and terminology to simplify
· Add feedback loops to test success and learn through the project · Redefine decision to build line · Make demarcation between strategic and tactical permeable to resources and information · Show production of brief in iterations · Highlight the financial approvals · Converge the risk and procurement blocks in schematic for stage 1 · Highlight specific milestones for project manager to achieve at each stage · Split design and construction stages · Consolidate with current terminology · Allow early introduction of construction industry · Indicate change management · Team building at construction stage · Handover at end of construction · Make Post occupancy stage a two stage process · Conclude each stage to lead into the next, maintaining a focal line through the model.	

The "Decision to Build" line was the centre of much debate during the group discussions, due to confusion with the decision for the financial approval to proceed within the client organisation. Whilst it was agreed that there was a demarcation between the strategic and tactical phases, there was concern over the rigidity of this line. The participants felt that the line should be permeable to allow the transfer of resources and information across the boundary. The solid line presented a fixed boundary implying a separation between the project participants above and below the

line. It was agreed therefore to re define the line as permeable to allow the transfer of resources and information between the two phases. In this way it is possible to cater for the construction industry input earlier and receive feedback from the later stages of this and other projects. Also the permeable boundary infers continuity of decisions between the strategic and tactical phases.

The sample groups were also concerned over some aspects of the flow chart presentation with the task checklists in the preliminary model. The aims of the flow charts were to clarify the tasks required at each stage of the project process. It was revealed, however, that the flow charts caused more confusion than clarity. For example the groups were unhappy with the separation of the risk and procurement boxes in stage 1 as this implied they were independent; the amalgamation of the design and construction stages caused confusion since it implied specific procurement routes; the information within the stages was found sparse and limited. These, and other, comments have been amended in the final model. The project stages have been redefined as the following, the only change from the preliminary model being the split of the design and construction stages:

- Pre concept stage
- Concept stage
- Feasibility stage
- Design stage
- Construction stage
- Post occupancy stage (1 and 2)

The design stage is in effect a two stage process of scheme design (approximately 30% design), followed by detail design. For clarity however, it is represented as one stage. The sample considered that the post occupancy stage could take on a two stage format to reflect the differing complexity of projects. The first stage being conducted post project, the second stage being conducted approximately six months later once the building had settled into normal occupancy. In this way the first stage would render feedback from the project itself, the second stage from the building design and quality.

It was recognised that not all projects would require both parts of the post occupancy stage to be completed.

There was a concern by some of the sample that tender action did not appear in the project process. This remains the case to facilitate flexibility in the framework. The procurement route will dictate to some extent when tender action occurs, it was considered a constraint to place tender action at a specific point in time. Therefore, tender action is inferred within the action plans dependent upon the procurement route.

It was clear that the sample required the model to contain more specific information regarding the required tasks of the project manager at each stage during the project. It was found useful to have an overall model but in some respects the holistic nature of the model presentation reduced the volume and quality of the information available at individual stages.

In order to rectify this it was agreed that a thorough checklist would be produced for each stage and a series of milestones suggested to bind the process together. In order to balance the level of information required with the clarity necessary to communicate the model philosophy, the model has been split into a hierarchy of information levels. The overall amended model, as presented in figure 10.1, provides the first level of indicative information binding the project process as a whole. This first level schematic has been enhanced only slightly in separating the design and construction phases and showing the "decision to build" line as permeable. The supporting information for each stage is provided as the second level, cross referenced from the first. The supporting information, developed within this chapter, consists of:

- A description of the strategic and tactical phases, figure 10.2;
- A checklist of the tasks required at each project stage, presented in chapter 11;
- A checklist of the contents of the brief iteration at each stage of the project process, presented in chapter 11;
- A list of the milestones required in order to pass from one stage to the next, figure 10.4.

These issues will be developed within sections 10.1.1 to 10.1.4.

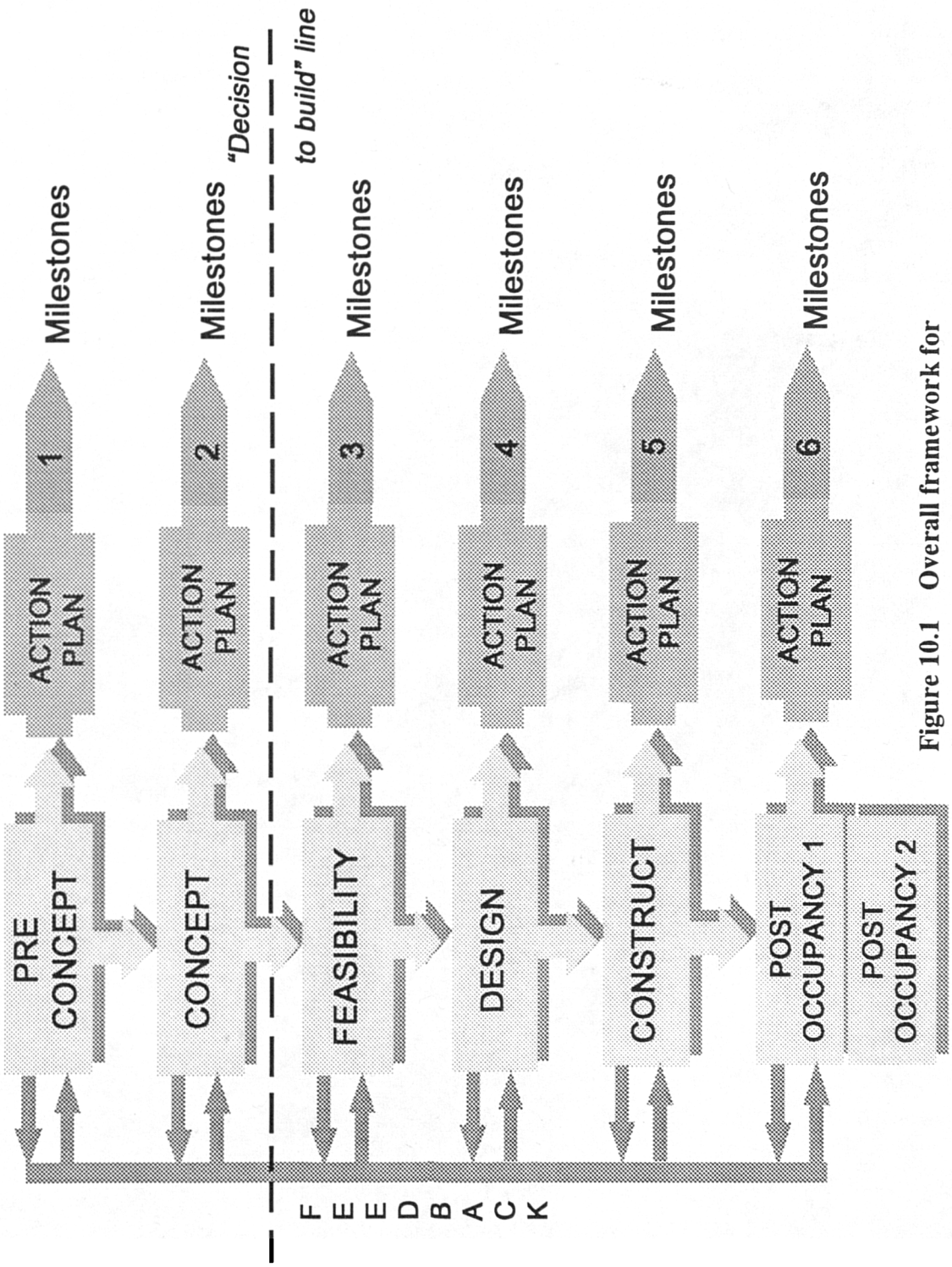


Figure 10.1 Overall framework for Strategic Management of major projects Source: Author 1994

10.1.1 Strategic - tactical delineation

All participants in the sample confirmed the view regarding the strategic phase of the project and recognised it as an element lacking formal attention in any project management process in use. The aims of the strategic phase were considered vital to the achievement of value for money. The model was considered to do this important feature an injustice. Whilst the strategic, holistic inference was evident, clarity in the model was found to be lacking. This was shown through some of the questions arising from the participants regarding the client's value system, exposing an omission of detail regarding the aims of the two primary phases. Specifically, strategic project management was seen as a new technique and the groups were keen to learn more about the tools and techniques for achieving success across a portfolio of projects. This has been addressed through the addition of specific tools and techniques within the task checklists presented in chapter 11. These provide clear guidance and explicit information at each stage of the project process regarding portfolio project management.

It was found that whilst the strategic activities occurred in some way in each sample organisation they were not bound into the project process sufficiently. The project board, for example, at the BAA airports, fulfilled some aspects of the strategic phase but were felt by many of the sample to be ineffective and a little distant from the project process. In contrast those of company F were positive regarding the effectiveness of the project board, also forming part of their project management process. This raised implications regarding the activities of the BAA project board members and hence their training needs. Reference to appendix 9 will indicate the comments with respect to the strategic functions conducted at present. In particular one of the participants in the BAA sample stated that "*Tactical project management is generally understood, if you were to ask anyone, without the benefit of this breakdown, what a strategic manager is, I don't think many people would know*". It was decided to provide more specific information regarding the tasks required during this strategic phase. (The implementation section 10.6 will discuss by whom these phases should be managed).

It was identified by the airport sample, that the strategic phase should not only consider the portfolio of BAA projects. It was necessary to manage the total portfolio of projects taking place on the airport, some of which would be conducted by other airports. Examples of these include: road resurfacing and maintenance by the council; fit out projects by tenants; construction projects in the local area affecting traffic flows. It is only by coordinating all these projects that a full portfolio management can be achieved. The action plans for the preconcept and concept stages have been enhanced to accommodate for this observation.

It was agreed by the sample that Strategic project management is required to understand the customer requirement. However, the BAA sample appeared uncomfortable with the inferred development role, ie working closely with the customer to understand their business and future needs, developing relationships with the customer groups and seeking opportunities to enhance the customer satisfaction. The development role was considered to be outside of the project management process. The more commercial organisations, such as company F and Lynton (BAA's development subsidiary) were of the opposite opinion. The framework has been enhanced in this area but in order to implement full strategic project management, it is likely that BAA will have to train managers in this development or strategic project management role. (This is discussed further in section 10.6.3.

Concern was expressed over the handover from the strategic activities to the tactical project activities, if these were to be managed by different person as suggested in the preliminary model: "*It's kind of difficult picking up what has gone before - you can't be fully effective until you do*" (BAA Scottish Airports workshop). It therefore became important to have continuity of personnel between the two phases and to document the decision making process such that changes in personnel did not shift the project parameters. The achievement and documentation of milestones to facilitate transfer from one stage to the next, will be addressed in section 10.2.4.

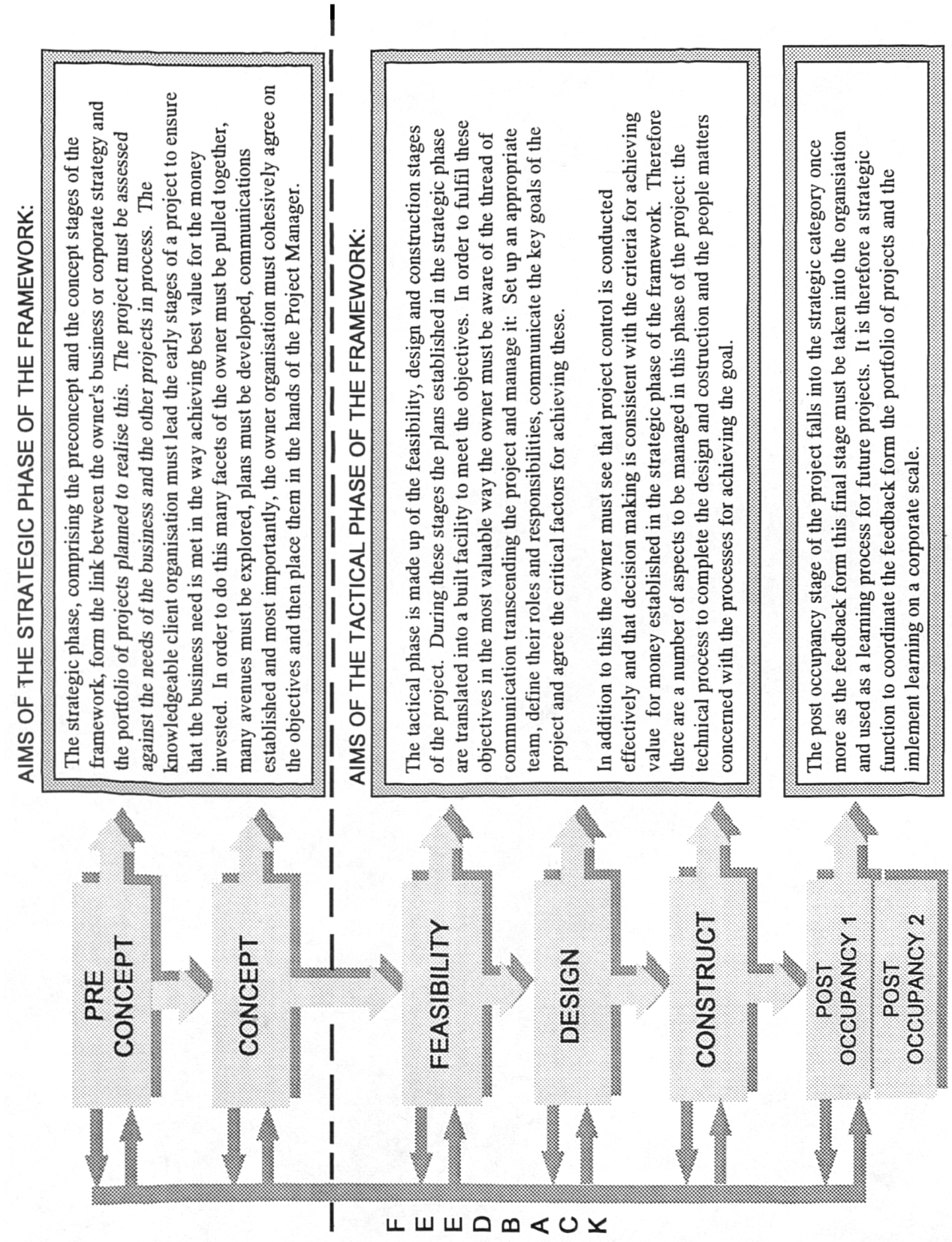


Figure 10.2 The aims of the strategic and tactical phases of the model Source: Author 1994

Figure 10.2 presents the aims of the strategic and tactical phases establishing the philosophy of the model. This schematic should indicate the inherent links between the definition of the project and business objectives in the strategic phase and the project implementation in the tactical phase. The decisions made in the former phase should set the base for the decisions made in the tactical phase.

This link should assist in interfacing the strategic phase with the tactical phase, clearly identified as a concern by the sample. Even with a change of personnel the data transfer across the decision to build line should be complete and explicit.

10.1.2 Supporting task checklists

In order to maximise the information given to assist the project manager at each stage of the project, the optimum presentation technique was considered a simple checklist. The aim of each checklist is to provide the project manager with guidance as to the required tasks during the project lifecycle in order to increase the chances of success. The contents of each checklist in the revised strategic project management framework were drawn from three main sources:

- critical success factors identified in the literature,
- processes considered to be best practice from within the sample,
- direct suggestions from the research participants.

The checklists make explicit the factors considered to be pre requisites for success at each stage, minimising jargon and technical terms.

The results from within the sponsoring organisation also indicate an inconsistency in project management processes across the organisation and a lack of common understanding of the project stages. It is important that the project manager knows which stage in the process he/she is at, such that the required tasks may be completed and the milestones fulfilled. Each checklist therefore contains a definition of the project stage to accompany the main tasks required. The checklists can be seen in the tables combined within the strategic project management framework in chapter 11, entitled *Task checklists*.

The checklist arrangement was formed in response to strong requests from the interviewees and workshop participants for specific tasks; the raw guidelines of the preliminary model were found to be too "loose". The philosophy is that the checklists act as a memory jog to ensure that all the items are considered. The degree to which each task is fulfilled will be dependent upon the nature of the project. It is the intention that, whilst the checklists present tasks considered as success factors for each stage, they act as a tool box, from which the project manager may select the appropriate tools.

The framework should remain flexible and has allocated the tasks according to where they *should* be completed. Some tasks may, out of necessity, fall into different stages of the project management model. However, it is important to stress the importance of addressing each of the stages and completing the tasks therein, in order to maximise the chances of reaching a successful conclusion. This was reflected by a member of BAA "*We're quite good within BAA at formulating a program and picking out the bits that we think will be useful and easy. This must be a whole process*". Whilst this view was echoed throughout the sample groups, concern was expressed over the resource and time implications the model would present the project organisation. The way in which these checklists are used by the client organisation will be addressed in section 10.6 when the model implementation is discussed.

Thus far the discussion has presented the strategic and tactical philosophy of the model and presented the enhancements required to the task checklists for each stage. In order to communicate the project scope and definition to the project organisation a project brief must be developed. The next section will discuss the issues relating to the brief development in the preliminary model.

10.1.3 Supporting project brief checklists

The results indicate that the iterative development of the brief is not explicit within the preliminary model. It gave the perception that the project brief appears at a specific point in time. Due to the poor performance of the UK client in producing a briefing document in the past, it was felt important by the groups that the contents of each brief iteration were produced to form part of the supporting data. The sample were keen to formalise the briefing process in order to assist the management of the client and project stakeholders. The use of checklists was suggested to introduce consistency in the contents of the brief across the organisation. In addition the checklist could be used as a communication aid in managing the input from project stakeholders. The benchmarking process highlighted the sophisticated approach to development of the briefing document by North American project managers.

The information gathered from the North American research was amalgamated with the existing information and the views of the sample to develop the brief contents for each iteration.

There are many parallels between the brief checklists and the checklists for the tasks at each stage since the information gathering process relies on decision making, planning and programming. That is, the early stages of the project are much to do with the project scope definition, communication and preliminary design details. So the task checklists are actively seeking out information to add to the next brief iteration. The North American client and contracting organisations were found to prepare lucid and informative briefing documents, many of which were seen during the data collection interviews. The interviews investigated the method by which the project manager collects this information and the techniques for managing the input from the user groups. It is evident that the success achieved in this area is based upon the time allocated and the formalised way in which the stakeholder and user groups are represented in the early stages of the project. The US project manager is given a higher degree of authority and autonomy, exhibiting control and leadership. The documents observed in the US were consolidated with the

framework in order to produce a list of the contents for each brief iteration. (It was also necessary to enhance the task checklists in order to formalise the data collection for the brief iterations).

At the time of writing the Japanese land costs exceed the capital cost of a project on a ratio of 10:1. The motivation behind reducing capital cost is therefore low and more effort is expended in understanding the client requirement such that the investment in land realises a valuable product. The contractor generally ensures that the site is used to generate maximum value to the client, not necessarily in terms of cost.

The brief iteration checklists may be seen in full in chapter 11 within the strategic project management framework. The brief checklists are arranged in such a way that the project manager may identify the contents required at each brief iteration and tick when the item has been addressed. The stages of the brief iterations directly reflect the project stages:

- **Strategic brief** produced at the end of the preconcept stage
  Aims: To produce a cohesive understanding of the project goals, scope and budget, reporting structure and the basic schedule requirements.
- **Concept brief** produced at the end of the concept stage
  Aims: To produce a statement of the project scope and the broad design information to allow the project team to generate alternative schemes for the overall organisation of the facility and layout of spaces.
- **Performance brief** produced at the end of the feasibility stage
  Aims: To facilitate translation of the client requirements into a well defined cost effective building design in terms of size, character and performance.
- **Technical design brief** produced at the end of the client design process
  Aims: To detail the design character, layout of individual rooms or equipment, occupancy requirements, building services requirements and the actual construction details.

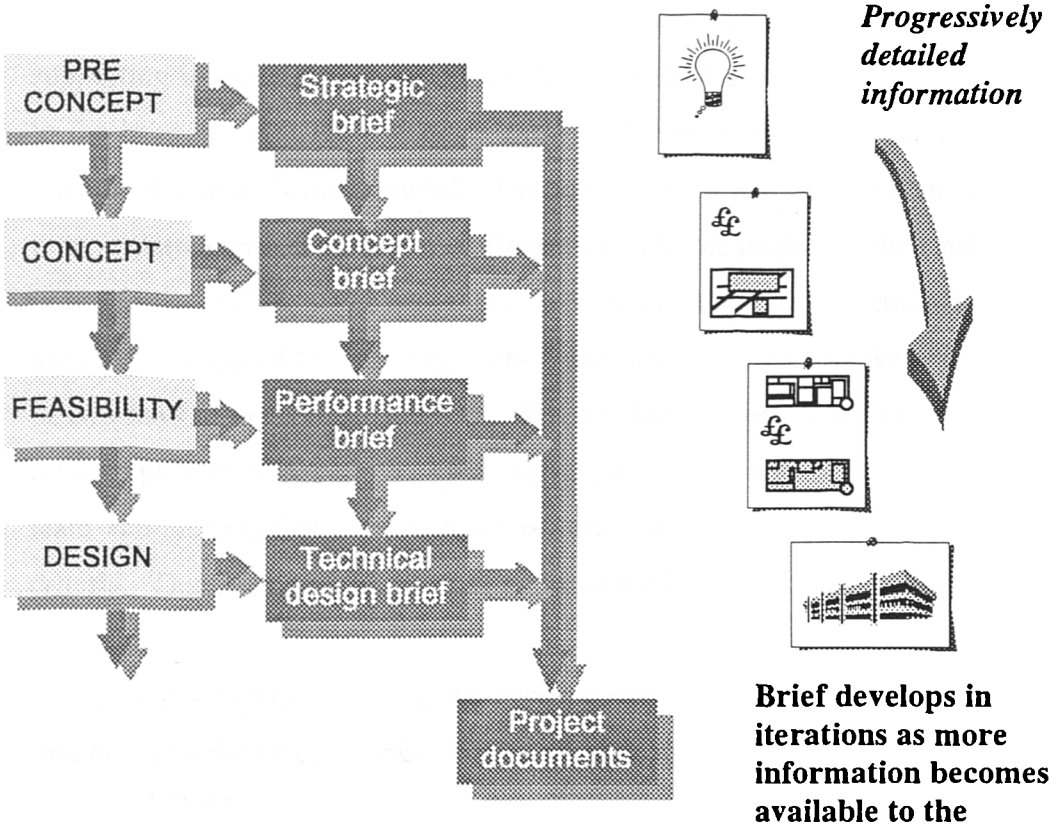
The rationale behind the iterative brief development is presented in figure 10.3, highlighting the progressive build up of information as the project proceeds.

BRIEF DEVELOPMENT

The briefing activities clearly define the needs of and criteria for a new facility or a development program. The briefing process is essential to provide an adequate foundation for the design of the complex buildings required at an airport.

A brief can be considered as a distinct step in the project's lifecycle, but in reality it forms the completion of an iterative process gradually refining information throughout the predesign and design stages.

The purpose of briefing is to organise the problem-seeking and problem-defining activities so that the subsequent design process can function smoothly.



It is important to emphasise that each stage of the briefing process is a major building block and a decision point. The research framework recommends that the project should not continue onto the next stage until all the criteria from the current iteration have been addressed.

Figure 10.3 Explanation of the iterative briefing process

The iterative development of the brief gradually builds information into a briefing document, recognising that the original concept for the project becomes furnished with more information as the project progresses, decisions are made and information becomes more comprehensive and available. The early stages of the brief involve the end users and the stakeholders to ensure that all the requirements are placed on the table for consideration at the early stages of the project imposing least cost. This responds to the view that "*if the people involved in the project are the ones that are going to live with their decisions - that's what concentrates the mind*" (BAA Stansted workshop participant).

The *Project Manager's report* and the *Concepts and Issues report* sited in the brief iteration checklists are additional to the brief document itself. These reports act as supporting information, reporting the decision making process experienced leading to the brief report. The Concepts and Issues reports was adapted from a similar document seen in North America. The consultants, client, design team, stakeholder representative come together and effectively build the project in their minds. Many issues from funding to site access are discussed and recorded in colourful messages around the walls of the meeting room, where they stay. This takes place over one or two days at the end of which the sketches, lists, graphs, costs etc are bound into a Concepts and Issues report. The method by which this is put together binds the team and ensures that each member is aware of the issues, constraints and design criteria. This is a powerful process which should continue into the design process.

Concern was expressed during the participative workshops at the missing physical link between the stages. These brief iterations act as a link handing one stage over to the next. The project's history may be tracked through the development of the project brief. The iterations of the brief represent one of the milestones to mark the end of the process stages and formal approval of these documents should be pursued from the key project participants.

10.1.4 Supporting milestones

In addition to the briefing document discussed above the sample were keen to receive milestones for the project stages as a set of "deliverables" to assist project control. It was clear in completing the benchmarking exercise that the use of milestones and strict schedule markers, resulted more readily in successful completion. As one participant from company A commented "*There is a danger that too many committees become non productive, opinion shops*". The use of milestones for each stage should focus the natural project committees toward production of outputs. In producing the list of milestones for each stage of the project process it was necessary to capture the essence of the particular stage within a few outputs. A balance had to be struck between the information formally requested and the client need in order to minimise the additional burden on the project manager in the production of these milestones.

The groups readily made reference to the manufacturing process, identifying the use of milestones and cut off points in the new product development process. For this reason it was decided, within the group sessions, that the use of "go/no go" markers during the project gave the opportunity to halt the project once started. It was commented during the research that projects were often impossible to stop once they had embarked on their "roller coaster journey".

Figure 10.4 presents the milestones required at each stage of the Strategic Project Management framework. The milestones mark the successful completion of each stage and "*should not be readdressed unless you come to a problem*" (Lynton workshop participant). In order to test the process performance on each project it may also be possible to measure the degree to which these milestones have been met. In this way the project process performance can be recorded for use in project process improvement efforts and feedback.

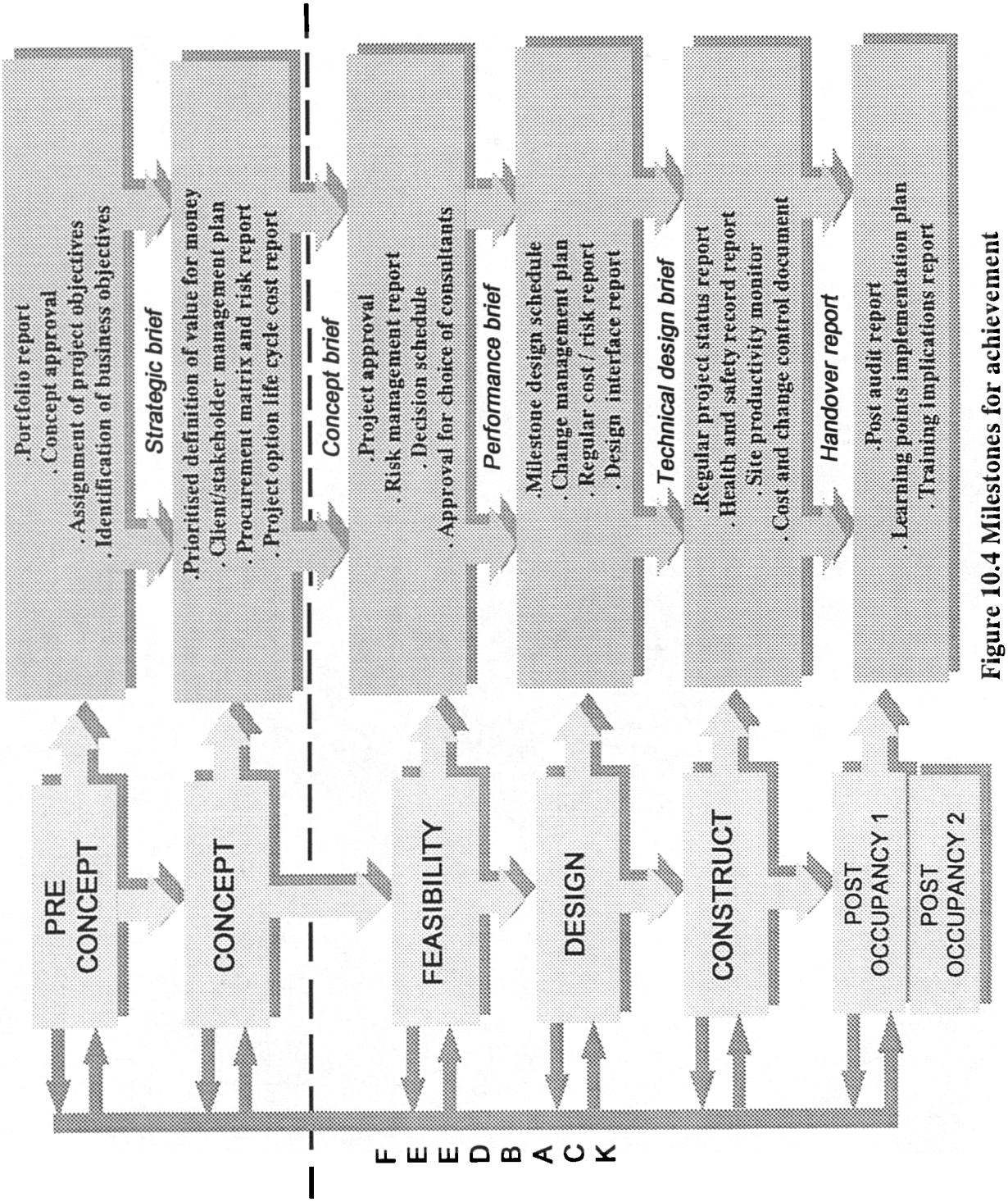


Figure 10.4 Milestones for achievement through strategic project management model Source: Author 1994

In summary the chapter so far has presented the overall model framework and a series of supporting pages to assist the achievement of a list of project success factors, the production of the brief and the achievement of project milestones. These are shown in full in chapter 11. The next section will address the achievement of a "value thread" through the project linking the project objectives and values of each project participant with those of the client. This formed the second category of results in chapter 9.

10.2 Ensuring a value thread

This section is concerned with the points in table 10.2, below. The following statement summarises the main points concerned with issues in the second results category:

Develop the value system analysis to facilitate environmental interaction over time and responses to value system changes with key personnel.

Results category: *Table 10.2*	**Responding actions to develop model:**
3. The model must recognise value as political, time and organisation dependent, and environmentally motivated	Develop the value system analysis to facilitate environmental interaction over time and responses to value system changes with key personnel
· Show environmental interaction at start of model · Indicate early stage responding to opportunities as well as needs · Split between client and multi value systems should not be a clear division, one should lead into the next · Test value at each stage through feedback and milestones	

The discussions held across the sample revealed concern over the evolution of the project during the client's changing requirements. The definition of value and continuous reinforcement of the value message was welcomed by the sample who considered "value" a concept understood by few project participants. There was a common feeling that the achievement of value was often hindered by the lack of attention to the needs, with too much emphasis placed upon the budget and reducing the cost regardless of the quality. "*We always dodge the issue of quality through slashing projects and deferring projects*" (BAA Heathrow workshop participant). It

was agreed that, by establishing the project objectives in relation to the business objectives (as was depicted in the preliminary model), the problems would be reduced. However, concern was shown over the inherent link between senior personnel and project values. Careful analysis could be undermined by the few powerful figures within the client body imposing their personal views of value on the project. The sample were keen to see methods to manage these key, political figures. The model was found to lack reference to the shifting nature of value as personalities change within a project and the complexities caused by internal politics within the client value system.

Conclusions from the literature made the assumption that value within the client organisation was bound cohesively within the client value system. For example, once the value objectives were defined by the client, then it was inferred that the client value system would hand over control to the multi value system. The multi value system represents the mixed and conflicting objectives of the many parties to the project process each with their own personal, organisational and project objectives. The preliminary model represented a split between the client value system and the multi value system after the decision to build line. This was considered by the sample to misrepresent the real life issues in managing value. The requirement to bring these into line with the client's interpretation of value calls for strong communication and leadership through the project. This can be achieved through management of a "value thread".

Whilst the concept of the project value system and the multi value system were received enthusiastically, the representation presented a number of problems to the workshop participants. Firstly the clear definition between the client value system and the multi value system was found to be too exclusive. The groups were unhappy with the implications this made regarding the contractor involvement early in the project process. "*The client process is not mutually exclusive from the construction industry*" therefore a clear cut between the two is wrong. Figure 10.5 presents a new interpretation of the value system analysis: The client value system is seen to extend through the project having most influence in the early stages when the project values

are defined and then later when the project success is assessed. This continuous thread of the client's value system through the project forms the basis for the common values within the project. The multi value system is seen to arise before the decision to build and reach maximum influence at the point at which there are maximum parties involved in the project.

This new value thread, gradually filtering from the client value system into the multi value system should respond to the comments of one external participant: "*There is a gulf between the client and contractors, if the model could draw a circle around the* (combined) *client and multi value systems it would be doing wonders.*"

The value thread is achieved through the checklists arrangement, such that business value, through the portfolio of projects, is defined in the preconcept and concept stages. From this base the individual project value is then defined in the concept and feasibility stages. This definition forms the basis of the briefing document such that the "thread of value" is passed down the project process via strong communications channels. Common agreement of the project values early in the project process should enable management of conflicting objectives that may arise among the project stakeholders. By understanding the issues arising during the definition of the project values, the possibility of conflict arising between objectives among the project organisation should reduce.

It is interesting to note the relative difference in the value systems across the international sample. The Japanese client organisation relies very much on the contractor (in the case of the big six) to add value to the project. The contracting organisations, by setting up long term relationships with the client organisation, can interpret the client's definition of value for money from early in the process. The client hands over much of the control of the value decisions to the contractor. The shape of the client value system and multi value system indicated in figure 10.5 therefore vary accordingly.

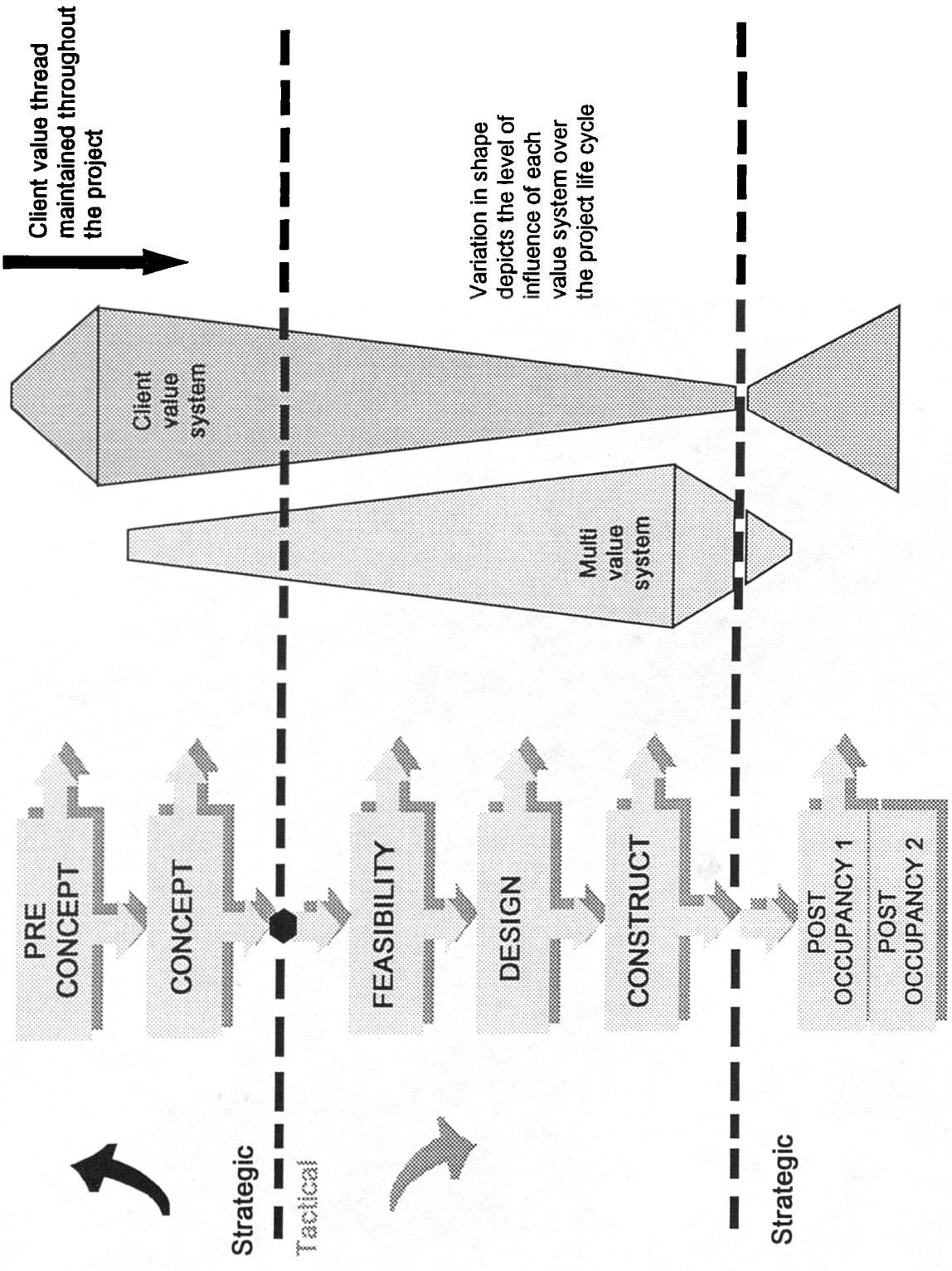


Figure 10.5 The value thread through the strategic project management model Source: Author 1994

It also became evident that one of the primary problems for the project manager is not particularly managing the input of the various external professionals to the process; but more so the client body itself. The groups showed empathy with the multi headed client, identified in chapter 3, but actually strengthened the case by indicating that the client body presented more problems than the multi project team. Political influences and powerful key players must be pulled together by the project manager who is inherently less powerful than them. This poses problems for the project manager with limited empowerment. Company E were clear that *"it is value for money to have internally empowered project managers because they carry the company E message, they know what the brief is and can transmit the value message".* The model is considered to glide over the client management issues inferring it presents no problems to the project manager. Clearly power and people management must be more explicit within the strategic project management framework. Training may be required in specific areas to realise the enhanced level of people management required in the framework. This is addressed in section 10.4.

The value system shown in figure 10.5 should be managed with effort relative to the influence exerted by the client and multi value systems. In the early stages therefore the client body requires full management and leadership. As the project progresses and the multi value system begins to exert an influence, the management task is related to the interface between the two value systems. Common value criteria must be formed and the clients vision must be communicated to the project team. The tasks held within the checklists realise the actions necessary to achieve this shift in focus as the project progresses.

This section has discussed the complications of the value system and the amendments to the model required to enhance the communications and management of value once defined. The specific tasks related to management of value are discussed in the next section, where the project value chain is broken up into its constituent processes.

10.3 Sub processes across the model

This section is concerned with points in table 10.3, below:

In order to achieve a common thread across the model, it should be made up of a series of processes, each traversing the strategic and tactical phases

Results category: *Table 10.3*	**Responding actions to develop model:**
4. Control mechanisms must be established to maximise the value across the project	In order to achieve a common thread across the model, it should be made up of a series of processes, each traversing the strategic and tactical phases
· *Set up strategic procurement issues at start of model* · Allow the formation of sub project models · Indicate milestones for cost and schedule · Facilitate handover from strategic to tactical phases · Contract development early in the model · Bring in cost and schedule earlier · Show management of people and politics throughout the model · Ensure transfer of value from client to contractor	

The groups expressed concern over the information available regarding control throughout the project management model. Whilst wishing for a simple model they were also keen for more lucid information. Specific control techniques for procurement, cost and schedule were found an omission in the model. In addition it was apparent that many aspects of the project management process were understood in isolation. What was often missing was an understanding of how the tools, techniques and processes fitted together to form a value adding process. For this reason the model has been broken down into a number of parallel sub processes indicating how the stages are bound together across the project process. This may be referred to in figure 10.6.

The constituent sub processes within the preliminary model included: value, design, risk, procurement, time, cost and quality and finally people control processes. However, it was felt necessary to also add detail to the people management required to interface between the physical stages and other personnel in the project process.

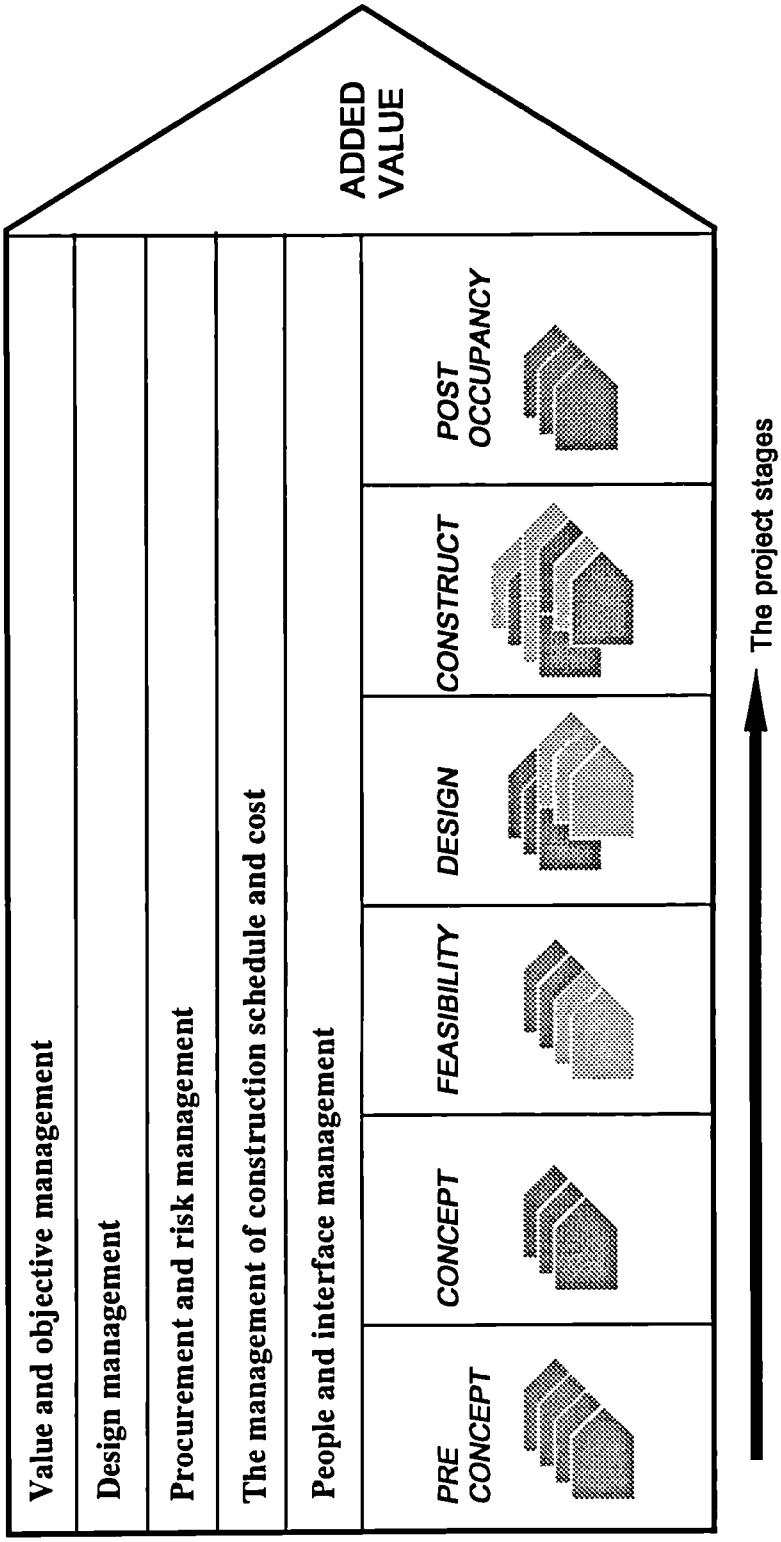


Figure 10.6 The project value chain Source: Author 1994

The sub processes therefore have been detailed as below in accordance with the emphasis inferred by the research sample:

- Value and objective management
- Design management
- Procurement and risk management
- People and interface management
- The management of construction schedule and cost

The value chain analogy of Porter has been used as a framework within which to place these processes, indicating the primary and supporting activities that occur during a project, figure 10.7.

Each of the sub processes contain their own project success factors combining to form a successful project. The checklist of tasks for each stage of the project process can be separated into their subprocess constituents, forming a matrix of project stages and processes. The value chain is exploded in figure 10.7, in which the task checklists are summarised and placed within the value chain arrangement with the processes flowing across the value chain. This matrix type arrangement is indicative of the interdependence of all processes and stages in the model.

This representation achieves a number of objectives: Firstly it makes explicit the sub processes across the tasks required at each stage of the project process; secondly it indicates that the stages are bound together by links across the processes; it also indicates the interrelationships between the distinct stages and the continuous processes. The value chain analogy infers that each step of the project adds value and is bound together by the sub processes achieving business value for the organisation.

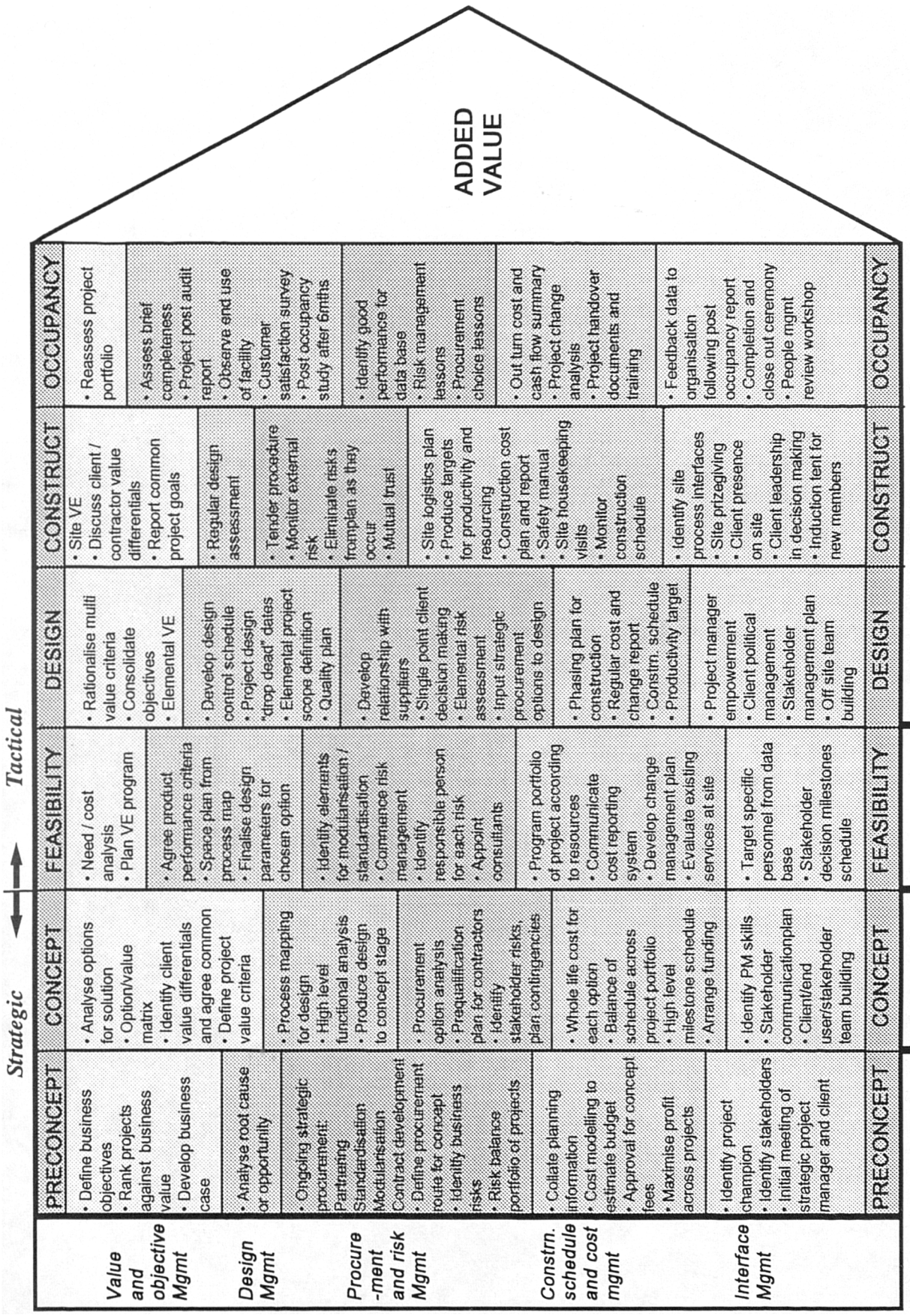


Figure 10.7 Project Value Chain indicating project sub process
Source: Author 1994

Each of the sub processes can not, however, be taken in isolation. The sub processes interact with one another to form the whole process. Whilst the project managers and client stakeholders in the sample could identify with particular elements of the sub processes, difficulty arose in placing them within a framework. For this reason it was considered useful to indicate the sub processes placed alongside one another, whereby the interactions could be easily recognised. For example, the interaction between the procurement and people management sub processes during the development of long term relationships and partnerships with suppliers and contractors; the interaction between the value management and the design management sub processes during the formulation of the design concept. The Japanese philosophy of construction highlights the inherent link between the design management process and the site production process. Every effort is made to facilitate construction led design so that these two sub processes work closely together.

This representation of the project process may also be used to highlight the input of different actors to the project process with time. It may be identified that the individual sub processes have more weight during particular phases of the project, but it is important to note that each subprocess spans nearly all of the project stages. For example, the construction schedule and cost management sub process actually arises much earlier than the construction stage of the project, indicating the planning that must occur early in the project to ensure efficient and effective site logistics. An holistic approach to the project process, considering the value added across each stage and the links between them, should emphasise the importance of the project process to avoid short cuts and "hurdling" between stages.

This section has placed the task checklists, presented in full in chapter 11, into a summary format splitting the tasks into their constituent sub processes within an holistic process. This is a useful single page summary of the tasks, which could be used as a reminder sheet for the project manager. The next section will discuss the importance of one particular subprocess, often considered to be a soft issue and therefore not worthy of input to a project management process. That is the management of interfaces between people and processes.

10.4 Ensuring people interface management

This section is concerned with points in table 10.4 below:

The management of people must be shown more significantly in the model. The effect of skills and politics must be recognised in developing a communications plan. Leadership and consistency must be maintained.

Results category: *Table 10.4* *1. Human issues should surround the project management process*	**Responding actions to develop model:** The management of people must be shown more significantly in the model. The effect of skills and politics must be recognised in developing a communications plan. Leadership and consistency in the model must be maintained
· Politics over rides many processes therefore indicate people management · Highlight single point of contact · Develop communications plan in the early stages of the model · Indicate the role of the project champion · Emphasise the continuum of people management · Define the client / project manager/ end user at start · Define project scope for each participant · Allow for redefinition of project value with changes in key personnel · Show the management within the client organisation to consolidate the client multi value system · Identify project managers leadership as a focal point through the model	

At least fifty percent of the time spent in discussion with the research sample tended to focus upon the difficulties of managing people and interfaces between processes through the project. It was highlighted that the nature of the client organisation, combined with the empowerment allocated to the project manager, had a significant effect upon the degree of conflict within the project team and the ensuing performance of the project team. (This bears out the studies outlined in chapter 6 with respect to the dependence between conflict and project performance).

"*It helps to have continuity of people - even if documented, if people change, the* (definition of) *value WILL change*". This view expressed by a workshop participant from outside of BAA, was echoed throughout the sample. It is clear that continuity of people and achieving a single point of responsibility are fundamental to the

achievement of success. However, the very nature of development projects are that they are long term projects, often impractical to maintain the same group of persons throughout. It is essential that the decisions made as the foundations for the project are recorded such that a map can be formulated of the decision progression through time. The reasons for past decisions can be assessed and the accountability for decisions therefore inherently increased.

It was interesting to record the level of concern and frustration over the political influence during projects. The literature on project management success criteria highlighted the need to maintain awareness of the political stakeholders outside of the organisation. The literature did not, however, recognise the significant effects of the internal client political influences on the achievement of value for money. The original model was therefore found to lack sympathy with the conflict of values within the client body, making the assumption that the client body spoke with one voice. The sample requested, in a number of ways, that the model be overlaid with people management success factors in order to assist the project manager in consolidating the views of client stakeholders. The framework has addressed this by making explicit the tools available for management of project stakeholders over the project duration.

It was considered important to grant the project manager sufficient empowerment and authority to act as the single point of contact for the client body. In many cited cases the project manager reported to a board of senior managers by whom major decisions were made. The benefits of this "project board" were questioned due to the autonomy removed from the project manager. It is intended that the project board and project champion actually reduce the political influence and reduce barriers to the progress of the project. It is often the case, however, that the project board members themselves have conflicting objectives. This infers that training for project board members may be required to ensure optimum value is added through their involvement in the project. Also the training of all those concerned with project management within the sponsoring organisation may be required such that a common approach to projects is transmitted to the construction industry. The strategic project management framework is intended as a guide to the common approach required by BAA plc.

The management of the interface between the people across the client organisation must be balanced with the management of the interfaces across different stages of the project. The relationship between the contractors and the client project manager must be forged through this sub process. The formation of trusting relationships and communication channels is facilitated by the tasks within this subprocess, to allow the contractor to input to the thinking process as well as the construction process. It is clear that the people management sub process must include the links between stages in the model that have been identified as barriers to value achievement, in particular the historical separation between design and construction. By interfacing these two stages of the project process one moves from sequential to concurrent engineering facilitating construction led design.

The people management sub process in the model is required to reduce conflict, enhance communication and define the activities of persons involved in the project. It was considered by the sample that the people management process must overlay the project process to ensure its attention throughout the project. Whilst the preliminary model addressed the management of people, it was considered to lack emphasis.

Figure 10.8 indicates this overlay by identifying the interdependency between process issues and people issues. The particular tasks required in order to effect the people management process can be found within figure 10.7, alongside the other sub processes in the project value chain. This can be seen to run throughout the project: At the start the sub process defines the project and stakeholder participants and their input; it sets up the leadership and communication patterns within the project organisation and ensures that the input of those with a stake in the project is managed efficiently to reduce conflict. In order to address the links required between the various parties to the project process the framework also emphasises the need for a path of communications between the client, the professionals and the contractors from project director to site operative. By making explicit the links and using a matrix organisation rather than a linear arrangement the flow of information and values should be open and complete. The international benchmarking study, particularly the results from the Japanese sample, highlighted the effectiveness of spreading the communications to sub

contractor organisations and reducing the interfaces that occur between problem and solution. That is, by conferring directly with the sub contractors, ie those with the best knowledge of their specialist field, solutions will be forthcoming and of greatest value to the project manager.

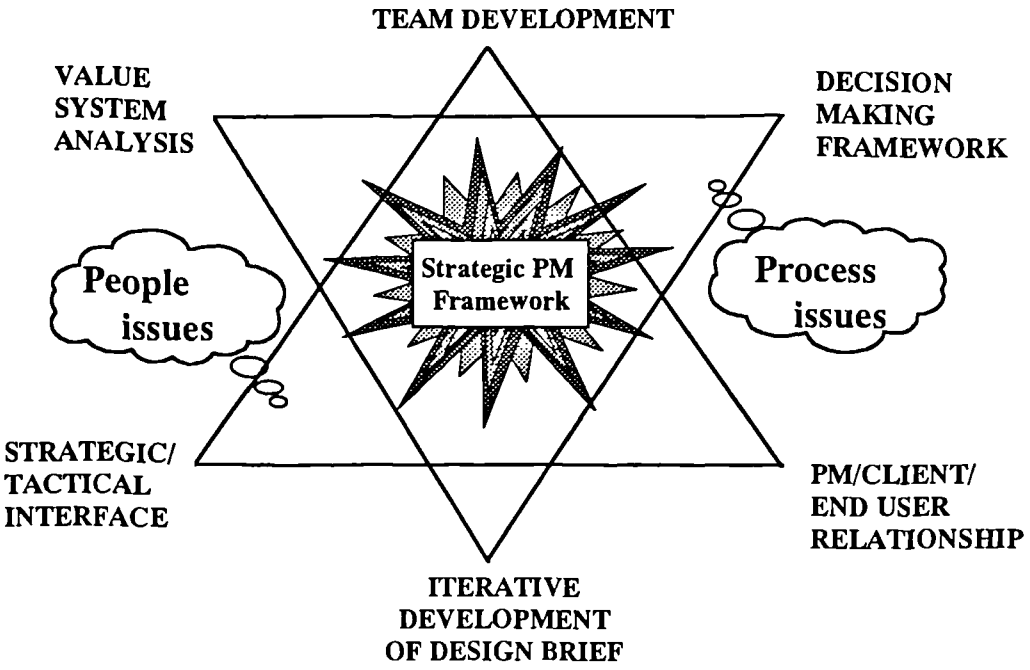


Figure 10.8 People and process issues as interdependent and interacting processes Source: Author 1994

The Japanese research study, with contractors and client organisations in Japan, highlighted features leading to the successful implementation of interface management. It was clear that attention to detail is part of the culture of the Japanese construction personnel. The sites were immaculate with charts around the walls on site, detailing the people on site, their interfaces, their handovers etc. The respect for fellow workers was evident from both sides of the client / contractor equation. It is evident that projects are seen as a coming together of a group of people to produce a product jointly, with minimum conflict. However, the success of this approach is based upon the Japanese culture of mutual trust and the dislike of confrontation, no one can lose face in the construction process. This could be considered to be at dipoles to the nature of the European construction culture, wherein the contractor and the client enter into contracts expressing a lack of trust and common ground. In order to integrate the

benefits of shared risk, mutual understanding and efficient handover of duties from one contractor to the next, the processes and procedures of the UK construction industry must be addressed in its entirety. By demonstrating the management and communication across human and process interfaces in the model and involving all facets of the project organisation, the message may begin to filter into the construction industry of the requirement for a cultural shift.

It is worth noting that, whilst the Japanese investigation highlighted the benefits of nurturing relationships and simplifying interfaces, a number of disbenefits were witnessed. It was apparent that the industry was balancing carefully on a knife edge as these relationships were maintained. The achievement of these relationships was in danger of compromising the value of other sub processes within the project process.

Implementation must therefore be all encompassing, spanning the end user and client, the suppliers, contractors and sub contractors. It is a process of value enhancement across all project processes and linkages. The "buy in" from all participants is therefore paramount to the full implementation of this model. Whilst this section has identified the people management issues within the model, it has also highlighted the need for a full and integrative implementation in order to shift the cultural barrier to trust, ownerships and risk sharing in the UK. The next section will discuss the issues to be addressed during the implementation of this model.

10.5 Implementation through involvement

This section is concerned with points in table 10.5 below:

Include an implementation plan indicating resource implications and skill requirements. Include role definition of the client, PM, end user, strategic project manager etc.

Results category: *Table 10.5*	**Responding actions to develop model:**
1. Implementation will require involvement from all parties to the project possibly presenting resourcing difficulties and negating it's purpose	Include an implementation plan indicating resource implications and skill requirements. Include role definition of the client, PM, end user, strategic project manager etc.
· Emphasise the holistic philosophy of the model · Develop the model as a framework from which the project manager can draw his own project management system for his/her particular project · Identify the inputs required at each stage · Possible role for a strategic project manager? · Give more information regarding the nature of the strategic phase · Develop implementation plan · Ensure project manager autonomy and empowerment · Allow the PM to choose how he/she manages the project given the model · Communicate model to all involved in the project process · Develop induction pack for end users · For regularly occurring construction of similar nature the strategic phase used as an umbrella function	

The comments regarding the implementation of the strategic project management framework were a mixture of concerns relating to the perceived human and time resource of the model and comments relating to the way in which the framework was to be introduced into the organisation. It was also concluded that the addition of a strategic project manager to the project organisation may be a way forward for the implementation of this framework. The specific difficulties of implementing a model for the management projects in an airport environment were a concern of the airport sample. Each of these will be discussed below drawing conclusions leading to an implementation plan for the strategic project management framework within BAA plc.

10.5.1 Resource requirement for the model

The strategic project management framework suggests a proactive and involved client, who leads projects in order to generate value for the business. This calls for client involvement in all aspects of projects to some degree. The client is required to be a fluid and trusting communicator; to set targets for site productivity; to manage the design process. These are examples of roles traditionally offered by others. However, the impediments to value creation, identified in chapter 5, lead to the conclusion that if clients wish to create value through projects then they must take control of them and eliminate these barriers and improve the links and interfaces between the parties to a project.

In presenting the preliminary strategic project management model to the sample with the above inference, it was clear that there were reservations about the resource implications during implementation of such a model. There was a mixture of views within each workshop group regarding the time implications of the model. Whilst some were clear that the model would enhance the decision making and therefore make better use of time, others were uneasy about the extra work generated by the checklists and reports required from the model. The discussions resulting from this concluded that the philosophy of the model was sound, contingent upon the level of additional work required of the project manager. The checklists are produced as a framework for use as a guide to assist the project manager. They should be used as required remembering they are factors necessary for successful project completion. The analogy can be drawn with a tool box within which are the tools necessary for achieving a successful project, from which the project manager may select those tools appropriate for his/her project.

The project managers in the sample expressed concern over their role within the project. It was observed within many of the organisations, especially those who had recently undergone privatisation from the public sector, that the authority delegated to the project manager was limited. These participants were eager to stress the importance of autonomy and authority to the success of a project. This confirms the view held by Morris and Hough (1987) in the literature, who recognise this as

a critical success factor for projects. Those organisations who delegated significant authority to their project managers suggested that the difficulties in managing interfaces during projects in other organisations was due to the lack of authority afforded to the project manager. The North American project managers in the international sample clearly had a higher level of authority and profile within the management structure than their UK counterparts. The success of the early stages of the project were partly explained by this autonomy of decision making and freedom to control the project according to the business needs.

The strategic project management framework must highlight this requirement and, through the implementation techniques, exemplify the success resulting from the North American attitudes towards the project managers role in the project organisation. This will be discussed in more detail in section 10.6.3.

The involvement of the end user presented management concerns to the group, but was considered to be necessary for the development of valuable projects. The involvement of project stakeholders must be controlled such that only those with a necessary input would be consulted. The election of a stakeholder representative was considered vital to the management of this element of the model. This has been built into the stakeholder management plan within the interface management sub process. These issues require a cultural shift within the way BAA approach and manage projects. It was therefore concluded that the success of the model would be contingent upon the way in which the model was communicated and implemented within the organisation.

10.5.2 Implementation into BAA plc

The conclusions of chapter 3 concerning organisational development and change highlighted the need to carefully implement any new process into an organisation. Early results from the pilot study highlighted the negative feeling towards any new initiative implemented from BAA group technical services due to the perception held by the airports of "dictatorship". The comments regarding the way in which

this model would be introduced are summed up by one member of the BAA workshop sample: "*This must be group led involving the airports in the development of the initiative. No one heard anything about Value Management until it was a set of guidelines*".

Indeed the choice for the action research methodology was based upon early signs within BAA of the tension amongst the different business units and the central Group Technical Services (GTS). The development of the model occurred through consulting and involving the airport business units, by accommodating their wishes and constraints in the development of the model. Having communicated the participative method of model implementation, the business units were open and helpful in the ideas for the model and were keen to use and test the model on projects under their management.

All of the sample organisations, due to the economic environment, had undergone significant changes to organisational structure and processes prior to the research. Thus the need for action and communication was recognised within the sample, agreeing that the model development had to be controlled centrally but implemented at a local level. "*It may be better to do a pilot project - one that's appropriate - and provide a support system to bed the framework in. Therefore these people can take the framework to other projects and it can be spread in this way*". Many suggestions of this nature were forthcoming from the sample, each presenting the common characteristics:

- Involvement of those who will be using the model
- Active use of the model to highlight deficiencies
- Communication amongst the business units and project managers
- Central control by GTS.

However, the model was considered to be of more benefit as a framework from which the project manager develops his / her own project management system, than a constraining set of rules. "*If the model becomes prescriptive rather than a framework you will defeat yourself*" (Company A workshop participant).

In conducting the research workshops individually at each of the airports, the separate business units could be benchmarked against one another. It was clear from the results that the processes conducted at each airport were slightly different; in fact value management was one of the few centrally controlled features of the projects. The implications of this are a:

- reduced organisational learning across the projects from different airports;
- lack of consistency exposed to contractors used across the airports;
- reduced level of central control leading to the airports being considered somewhat independently on a strategic level.

The airports also appeared to be competing against one another, trying to improve their own processes in the absence of the other airports. It was agreed throughout the BAA workshops that a common approach to construction project management would be beneficial to reduce the implications of the above features.

In addition a clear gap was recognised between the knowledge and systems produced at GTS and those actually implemented at airport level. This can be seen in the schematic in figure 10.9, depicting the time lag between the systems produced at GTS and their appearance at the airports. Whilst GTS were defensive over their project management systems, inferring that the model presented no more than they already used, the airports were more receptive, recognising the gap between the contents of the model and the systems currently in use. It would appear that GTS think they have successfully implemented more than they have due to this time lag. Thus the importance of a participative development of the model is emphasised so that the airports are moving along at the same pace as GTS and all business units perceive their systems to be at the same level of development.

It was evident that the BAA individuals held differing views and perceptions dependent upon their historical position and length of time with the organisation. Those who had been with the organisation for many years found the new ideas threatening and sought excuses for their dismissal. Those who had recently entered BAA since privatisation had a broader perspective on innovations and recommended

changes. This exposed the strong culture forming a resistance to change. The implementation of the strategic project management framework, itself recommending a number of culturally challenging changes to practice, has been carefully considered.

Through discussion with the sponsoring organisation it has been agreed that the airports will be fully involved in the introduction of the model into the organisation. This will take place through a series of project management seminars in which the project managers and senior managers will be encouraged to participate in future development of the project management framework. The model will be presented as an a holistic philosophy following which the processes across the model will be described by the senior managers both managing that department within GTS and also by the managers who will be using these processes. In this way ownership and participation is increased. To follow on from the introductory seminars for the project managers and senior managers, a series of training modules will be developed for training in specific tools and elements within the strategic project management framework.

The challenge then is to achieve acceptance and understanding of BAA's value philosophy from the construction and supplier industries involved in BAA projects.

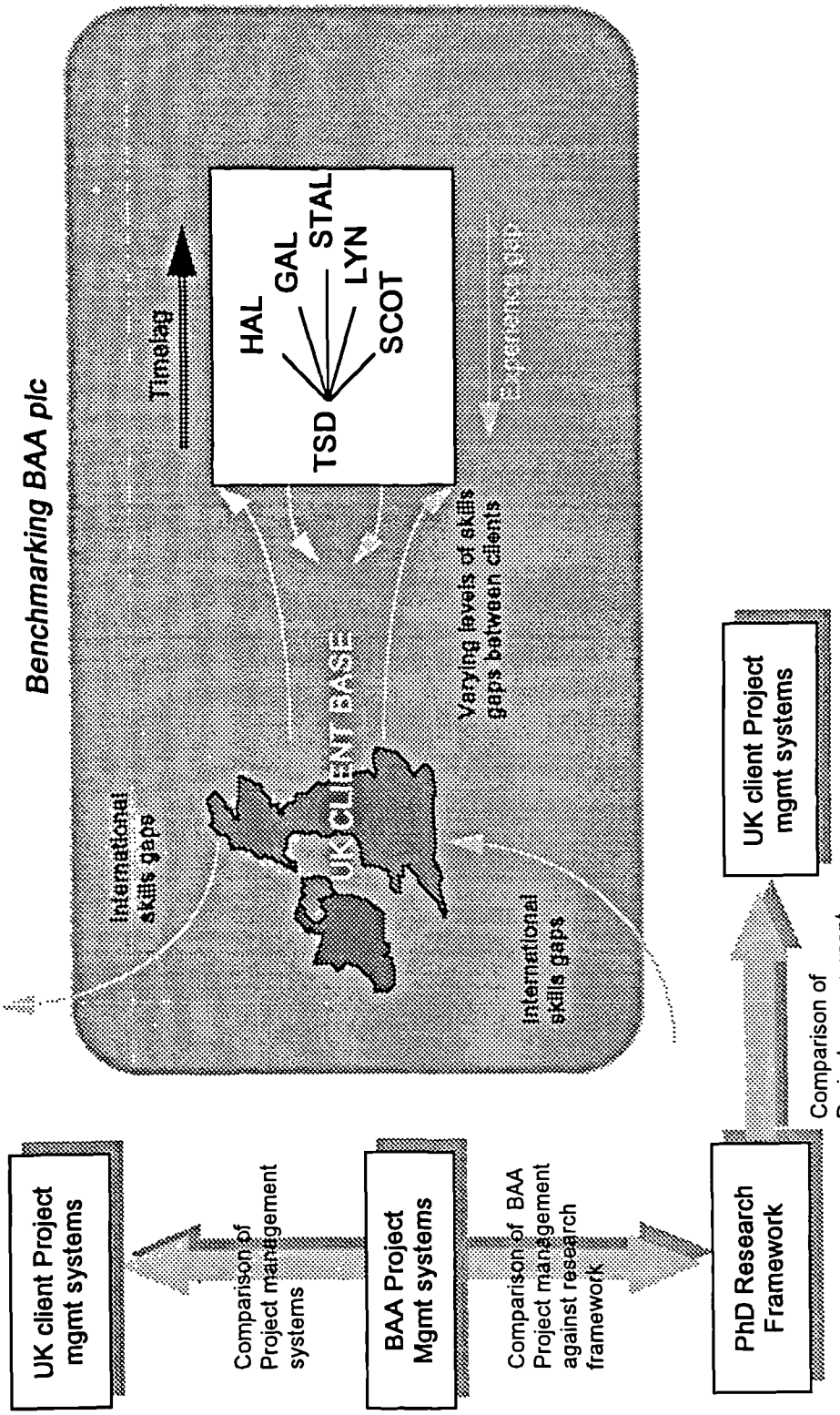


Figure 10.9 Benchmarking project management systems in the UK - timelag experienced in BAA plc Source: Author 1994

10.5.3 The strategic project management role

The sample groups recognised the skill gap between technical project management and the strategic project management identified in the early stages of the project. There were a number of responses to the suggestion that this gap be filled by the addition of another member to the project process, the Strategic Project Manager:

- Some members of BAA considered the project boards to fulfil the role of strategic project management adequately, whilst others considered that in practice they did not function effectively.
- It was suggested that the technical project managers could be trained in business skills and therefore understand the issues in the strategic phase. This was occurring in two of the North American organisations sampled, whereby the project manager was involved in the very early stages of the project, challenging the owner's needs and developing a user brief.
- A number of the sample organisations both in the UK and in North America were fulfilling the role of strategic project management only, contracting out the tactical project management role.
- Some of the sample felt that employment of a strategic project manager was the only effective way to achieve portfolio management in the strategic phase. However the handover from strategic to tactical project manager must be carefully managed.

It was concluded at the end of the workshops and interviews that the optimum solution for BAA would be to employ a strategic project manager at each business unit to manage the strategic issues concerned with a portfolio of projects at that location. The tactical project manager would form strong communication links as the project came close to the end of concept stage, when the decision to build is made. This has been schematically presented in figure 10.10. The responsibilities of the strategic project manager start at the preconcept stage and hand over to the tactical project manager at the end of concept stage. The post occupancy stage also becomes the responsibility of the strategic project manager across a portfolio of projects, such that the lessons from that project are learnt across the organisation and communicated amongst other projects as they develop.

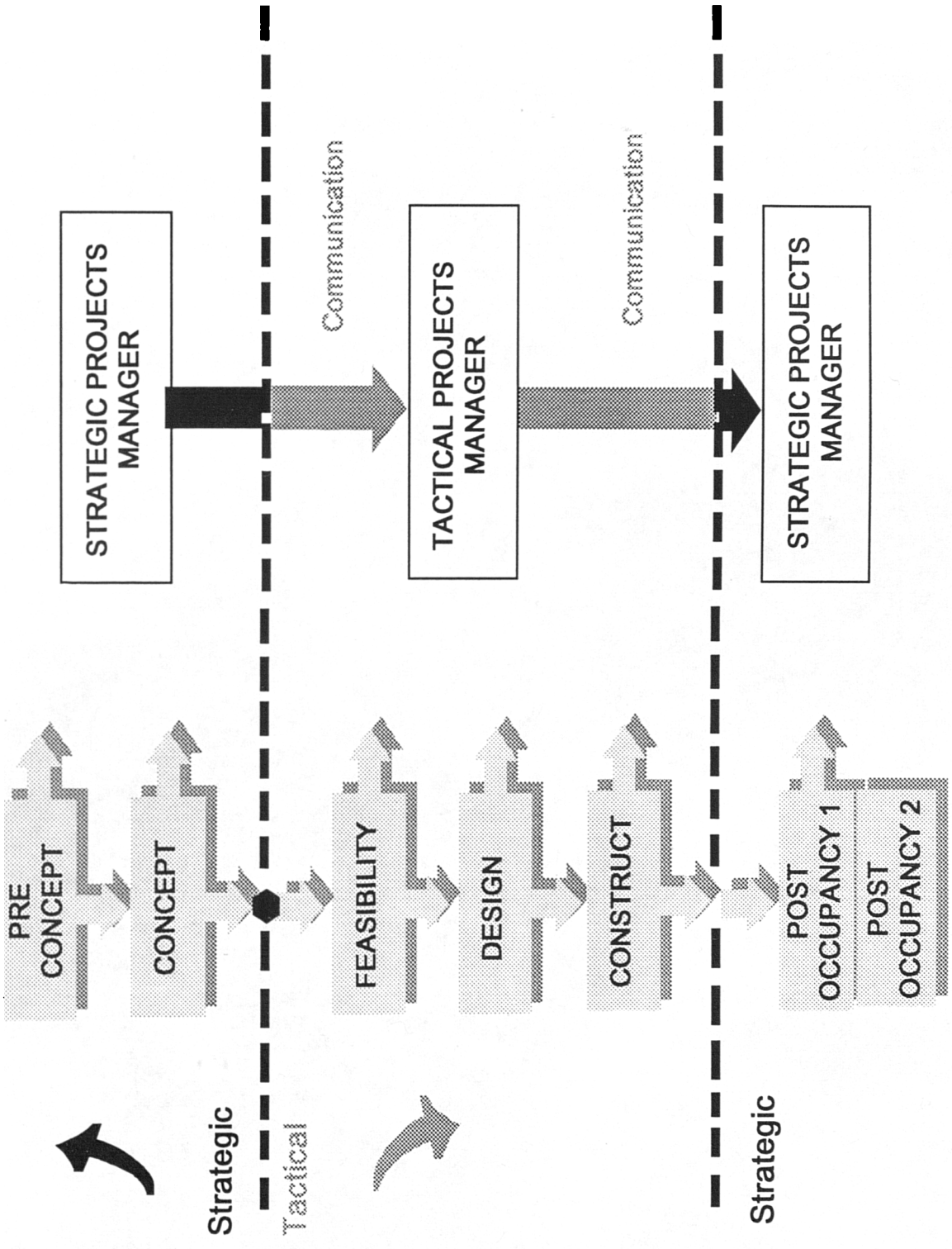


Figure 10.10 Role definition of the strategic and tactical project managers Source: Author 1994

10.5.4 The "airport project"

The particular complexities of conducting a construction project within an airport environment were addressed during the results chapter. It appears that the characteristics of an airport project established in chapter two are not exclusive to the airport industry. It was interesting to note that the majority of airport managers considered airport projects to be far more complex than others. Whilst no member of the remaining sample refuted the characteristics, the view was expressed that they were equally relevant to a selection of industries falling into a particular category. Company A, the private water company recognised each of these characteristics as being present in their construction projects.

It appears that it is more an issue of project scale and complexity than specifically of industry type. Those projects conducted on an airport that are within a "live" environment, of a high cost and involving a large number of user groups can be exceedingly complex, giving rise to additional management difficulties. However, many of the characteristics were experienced to some degree by most of the organisations participating in the research. The argument that the airport project is special and must have a particular project management system was negated by the investigation. It can be concluded that the model developed for the airport client could be used for any organisation, as each experience the same characteristics to some degree.

This section has discussed the implementation of the framework under the following headings:

- Resource requirement - emphasising the nature of the framework as a toolbox;
- Implementation into BAA plc - concluding that the framework requires centrally controlled implementation at the business units where the projects are managed;
- The Strategic Project Management role - concluding that the preconcept and concept stages could be managed by a Strategic Project Manager. The tasks falling into the feasibility, design and construction stages should be managed by a Tactical Project Manager, or at a point when the decision to build has been made and the client needs have been established.

- The airport project - concluding that the issues are the same for many industries but the degree of severity is exaggerated. Therefore the framework can be used by any client organisation procuring a large number of projects.

The next section will discuss the requirement for a model for the strategic management of small projects and those that are constrained by time and require fast processes.

10.6 The strategic management of small projects

This section is concerned with points in table 10.6:

Produce a model suitable for small projects management. Investigate a "fast track model" for fast track projects

During the workshop discussions it became evident that the management of small projects was of significant concern within the organisations and that the strategic issues were just as relevant.

Results category: *Table 10.6*	**Responding actions to develop model:**
5 The model must be flexible enough to deal with real life projects of various sizes and constraints	Produce model suitable for small projects management. Investigate a "fast track model" for fast track projects
· Develop model to manage small projects ensuring overall strategic management · Consider a fast route through all stages of the model for projects with limited duration	

It was commonly agreed that the size of project would impact the way in which any model was approached and it was therefore considered appropriate to suggest a model for the strategic management of small projects. In order to generate the information required of this model a participative workshop was held as a result of the earlier workshops and interviews. The principal results from this workshop may be found in chapter 9.

It was concluded that the small projects conducted within an organisation receive less profile and therefore are subject to less rigid controls. However, the small projects conducted at Heathrow amounted to £25.2m in the financial year 1992/1993. This is

a significant annual spend to rely on loose systems and sub optimal control. The participants to the small projects workshop were enthusiastic about receiving a model for the management of their projects. This was a marked variance from the participants in the major projects category. In this case the small projects managers requests were clear:

- A manager with an overview of the many small projects that are ongoing in one area of the business, to enhance communication and consolidation of projects
- A procedure for producing and signing off a brief from the client
- Planning time at the start of the project
- Use of preselected contractors to reduce the tendering time which is often disproportionate to the duration of the project
- The use of value engineering and life cycle costing techniques to reduce cost without reducing the quality
- Handover procedure
- Feedback by exception to generate list of contractors' good performance

Whilst this feedback was clear, the study was limited. The framework presented in this chapter for the strategic management of small projects is only a suggestion of the model that could be applied to small projects (projects less than £100,000).

In consolidating the comments from this workshop and the interviews within BAA regarding the methods of cost estimating and control for small projects it was decided that the framework generated for major projects could be used as the base for this model. Due to the large number of small projects within this classification it would not be appropriate to produce a framework for the management of individual projects.

The framework that has been produced combines stages 1 and 2 for all the projects and suggests management by the engineering manager as a portfolio of projects. The engineering manager maintains executive control of these projects holding responsibility for their cost and time performance. The tactical management is conducted on an individual basis by the small works project manager. On completion the post occupancy stage is conducted as a strategic function across the group of

projects. The final stage is selective and assesses specific projects for post project performance. Lessons from other projects are fed back into the organisation at a senior level via the engineering manager to facilitate organisational learning.

In this way the engineering manager takes a more active role in the early stages of the project and manages according to the client priorities and in line with the business strategy. The small projects are therefore managed under one umbrella at the start and break off into individual projects once the brief has been signed off. The level of involvement of the tactical small projects manager will depend upon the nature of the project and the skills of the particular project manager.

The model for small works management has much shorter checklists due to the nature of the projects and only a few significant milestones for each stage, in response to the desire by the sample to maintain simplicity. These may be found in figures 10.11a,b,c. Nevertheless, the philosophy of the model remains holistic and systemic, relying on interactions within and outwith the project environment. The stages of the project process must all be conducted in order to complete the project successfully and to add value across the portfolio of small projects.

In the case of fast track projects a selection of participants were concerned to have a model option to bypass some of the stages, whilst others recognised the necessity to conduct each of the stages and all their contents. A fast track project could fall into the category of a major or small project. The first task is to assess the size of the project and decide the appropriate model for its management. In suggesting that all stages of the model should be addressed, there was a view that this would take time, time that the project did not have. The implications of planning and interfacing on a fast track project are considerable, it is suggested that it is more relevant to conduct all the stages than for any other type of project. Once the project manager realises that the model is there to assist not hinder his/her progress, then its benefit may be more readily accepted. It was concluded that the model should be used in its entirety for these projects, but that it may be possible to reduce the quantity of reports to save time and effort.

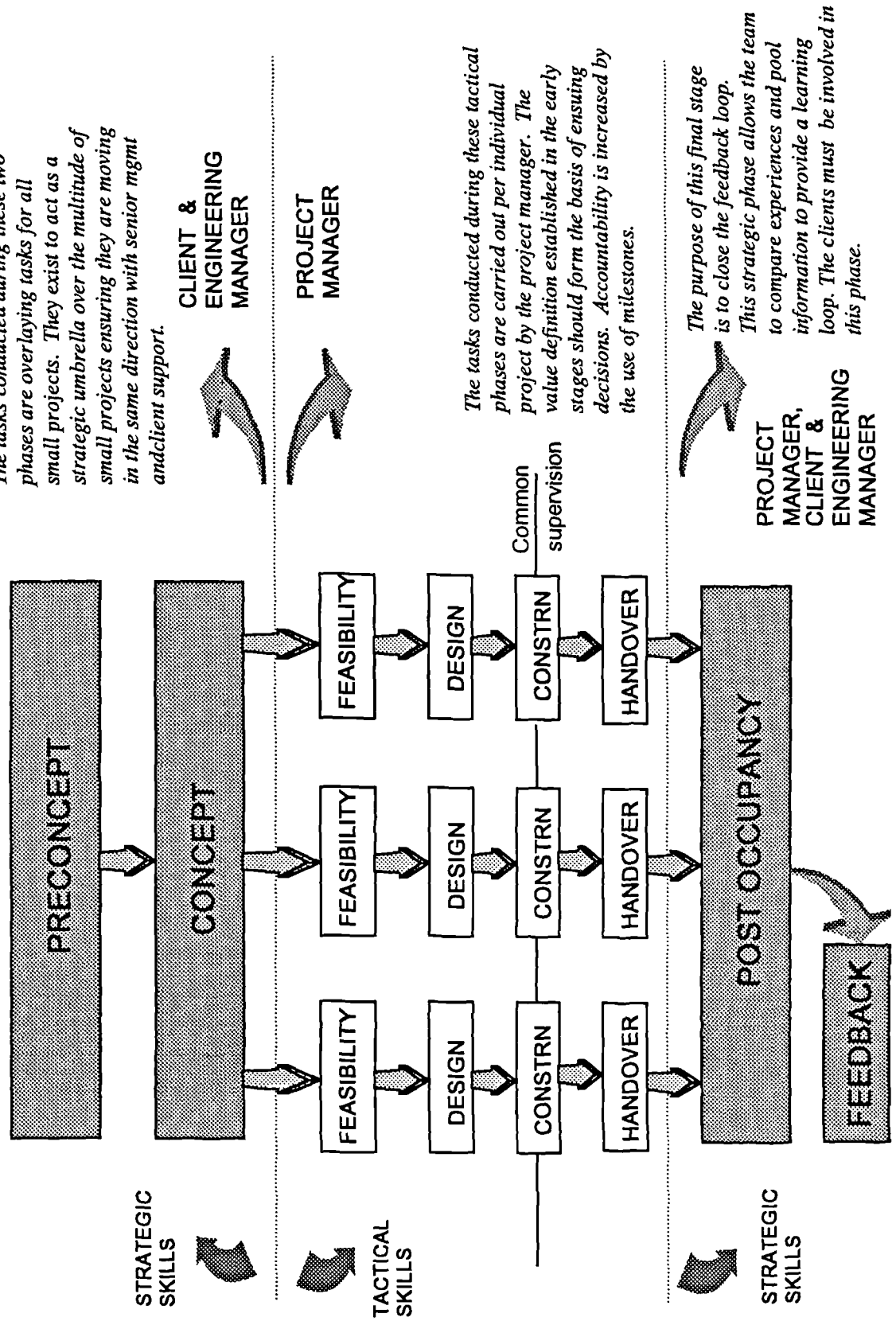
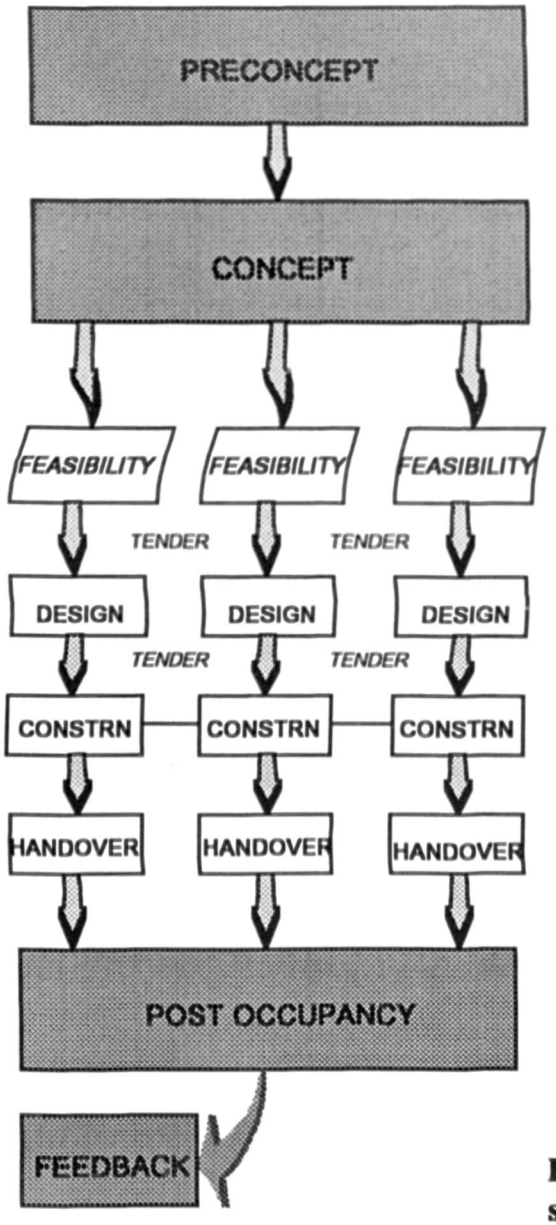


Figure 10.11a Small works model Source: Author 1994



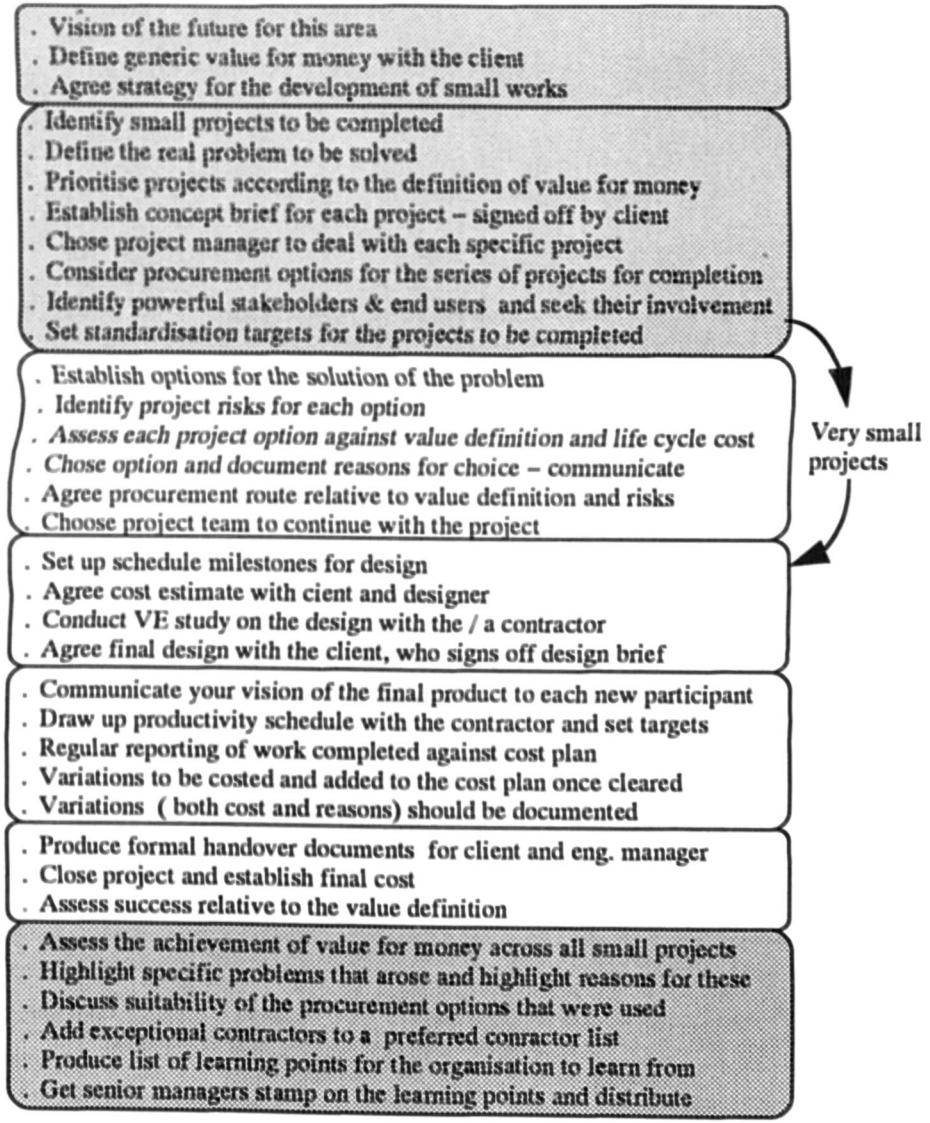


Figure 10.11bTasks required at progressive stages of small projects Source: Author 1994

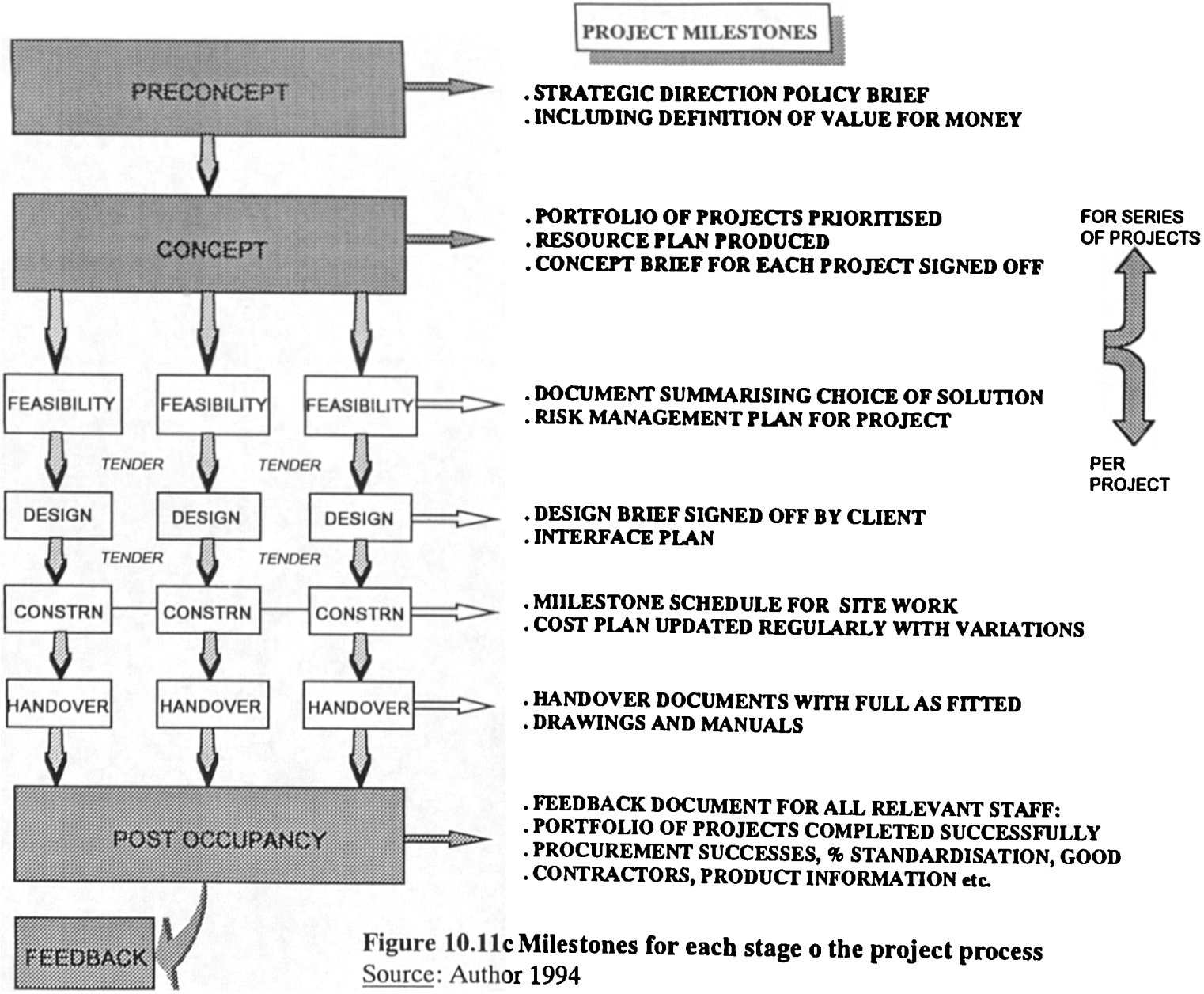


Figure 10.11c Milestones for each stage o the project process
Source: Author 1994

10.7 Summary

This chapter has discussed the implications of the results from the data collection process on the preliminary strategic project management model. It has been concluded that the model was received well by the participants to the workshops, but it has been necessary to enhance the contents of the model to provide more comprehensive information to assist the project manager.

The chapter was split into seven main sections addressing the results categories as defined in chapter 9. The conclusions from each of these sections are summarised below:

- The strategic - tactical delineation across the project management model was welcomed as it formalises and structures a process that happens in an ad hoc fashion in most organisations. The model has been enhanced to explain in more detail the aims of each phase.
- The action plans appearing in the preliminary model have been enhanced to contain more specific information in the form of checklists for each stage. Where appropriate the international sample have been benchmarked and suitable additions made to the content of the checklists. The tasks in these checklists are considered as the critical success factors for each stage of the project process and should be addressed without exception.
- The brief development has been described as an iterative process and a checklist has been devised for each iteration of the brief. This should be considered as the minimum contents for each stage in order to communicate the project scope to the key personnel. The brief iterations can be considered as the link between the stages forming a physical handover document.
- A set of milestones to mark the end of each stage and indicate the expected "deliverables" has been produced for use by the project manager. These should act as a focus for decision making and ensure that particular actions have taken place before moving forward in the project. The milestones can also act as key "go / no go" decision points in the project to allow the project to be stopped if it is failing to meet the necessary criteria.

- The value thread has been presented as gradually shifting from emphasis in the client value system to emphasis in the multi value system of the project organisation. The client value system maintains a thread throughout the project to act as a focus for decisions.
- The tasks have been divided into a number of categories and placed within the project value chain to show the sub processes that run across the project management model. This representation highlights the continuous and interacting processes that occur in a project and help to connect each of the tools and techniques in the model. The project value chain indicates the gradual reduction of uncertainty and visualises the progressive addition of value across the stages of the project.
- The people management process has been highlighted since the internal management of politics and powerful key personnel was indicated in the results as being of significant concern to the sample. Specific attention has been paid to the management of stakeholders detailing the processes to reduce conflict and tension. The Japanese construction industry has been sited as exemplary from which particular aspects have been introduced into the task checklists. However, not all benefits could make the transition across the cultural divide.
- The philosophy of the model has been stressed in order to defy the concerns of the sample that the model would demand large time and effort resources. The project manager should be empowered to manage the process as he/she desires. The checklists are for assistance not hindrance.
- Introducing the model into the airports should be conducted jointly between the airports and Group Technical Services to reduce tension, conflict and the time lag between GTS initiatives and implementation into the business units.
- A new role of "strategic project manager" has been suggested for the management of the preconcept and concept stages of the model. Careful handover to the tactical project manager should occur through gradual involvement in decisions as the project reaches it's concept solution. The strategic project manager again increases his/her influence during the post occupancy stage to facilitate organisational learning.

- The model has been slightly amended in suggesting a preliminary model for the strategic project management of small projects. It is argued that the strategic portfolio management is as significant in small project as for major projects.

This chapter has discussed the issues arising from the research data, leading to the development of the preliminary model to the final strategic project management framework. The discussion has gradually developed the framework which will be presented in chapter 11 as a *product* for use by project managers.

The final framework is very much a result of work within the BAA plc, the sponsoring organisation, and with members of the project organisations associated with BAA plc. Implementation has begun and will continue through the involvement of key personnel within each business unit. The development of the model will be continuous and the action research methodology has already realised some elements of the model within the organisation.

11 INTRODUCTION

Chapter 11 has been structured such that a project manager could pull out the chapter and use it as a framework in the absence of the thesis. The themes and comments that were discussed in chapter 10 have been collated and consolidated in order to form the final model for the strategic management of projects for BAA plc. The terminology will tend towards building and construction projects. However, the concepts should remain equally applicable to civils, electrical and information technology projects.

Chapter 11 will present the Strategic Project Management framework produced after a study of the current best practice in project management in US, Europe and Japan. The investigation began with the development of a preliminary model of the construction project management process following an intensive review of recent publications including literature on major projects, strategic management and successful project management. The final strategic project management framework presented within this report has been developed through a series of interviews, debates and group discussions within BAA plc and other client and contracting organisations in the UK, US and Japan. The framework presented here is very much a consolidation of views from the people that manage construction projects and therefore should represent a user friendly and flexible model. The framework is under continuous development as BAA strives to achieve world class standards in construction project management and therefore represents a fluid and developing picture of the project process.

11.1 Aims of the strategic project management framework

This chapter presents a framework of the strategic project management model to act as a guide to the processes that combine to increase the chances of success and improve the value of a major project. Whilst it is recognised that each project is unique and demands varying skills and tools to reach completion, there are a number of factors that have been consistently identified that lead to success on a project. Or conversely, the absence of these factors increases the chances of a project failing to reach the defined objectives. The framework draws together these factors for success into a logical sequence of tasks that need addressing through the project process.

The aims of the framework are to:

- define a project process to encourage a common approach to project management across BAA plc
- identify the factors upon which success and value for money are contingent
- provide a series of tools to assist in the management of the project process
- reduce the boundaries to the achievement of value across the project stages and between the project participants.

In order to achieve this the framework specifically applies a series of:

- easy to use checklists defining the factors for success
- checklists of the contents of the brief iteratively produced during the project management process
- tools and techniques identified in the checklists.

The proceeding section will define the stages that make up the project process.

11.2 The project process

In order to provide an overall framework for project managers the project process will be described. The project is made up of a number of stages in series representing the transitions through which the project passes to move from inception to completion. These stages are defined as:

- **Preconcept** - At the preconcept stage the project exists as a problem or an opportunity. The purpose is to open communication channels to ensure those necessary are involved in the project investigation and definition
- **Concept** - At concept stage options for the optimum value solution of the problem are investigated. The project team grows to develop basic space planning concept solutions.
- **Feasibility** - This stage refines the level of information to check the feasibility of the chosen concept under varying capacity and design conditions. As the scheme design develops the cost should be refined to + -10%.
- **Design** - During the design stage a multitude of professionals will join the team to realise the client requirements through management of design interfaces. Decisions should be based upon the project objectives as defined in the previous stages.

- **Construction** - The construction stage results in the physical realisation of the facility encompassing the work of various trades and the management of their interfaces. This stage represents the maximum escalation of cost.
- **Post occupancy** - This stage can be considered as a two stage process, learning from immediate project results and failures and learning from long term value assessments of the facility in operation.

These stages fit within the overall project process as defined in diagram 11.1. The stages are presented in sequential format due to the progression of information that must occur. However, it is worth noting that the framework is flexible and these stages should be integrated as much as possible. For example, the activities of the construction phase will affect the activities in the design stage (and vice versa) and in this respect they must not be delineated. However, for ease of presentation they are shown as sequential events.

This progression of stages allows the project manager to consider a discrete set of tasks at each stage. In an ideal situation the tasks at one stage should be completed before moving on to the next. These tasks, presented in simple list form in tables 11.1 to 11.10, constitute the actions required to reach an optimum level of project definition at each stage.

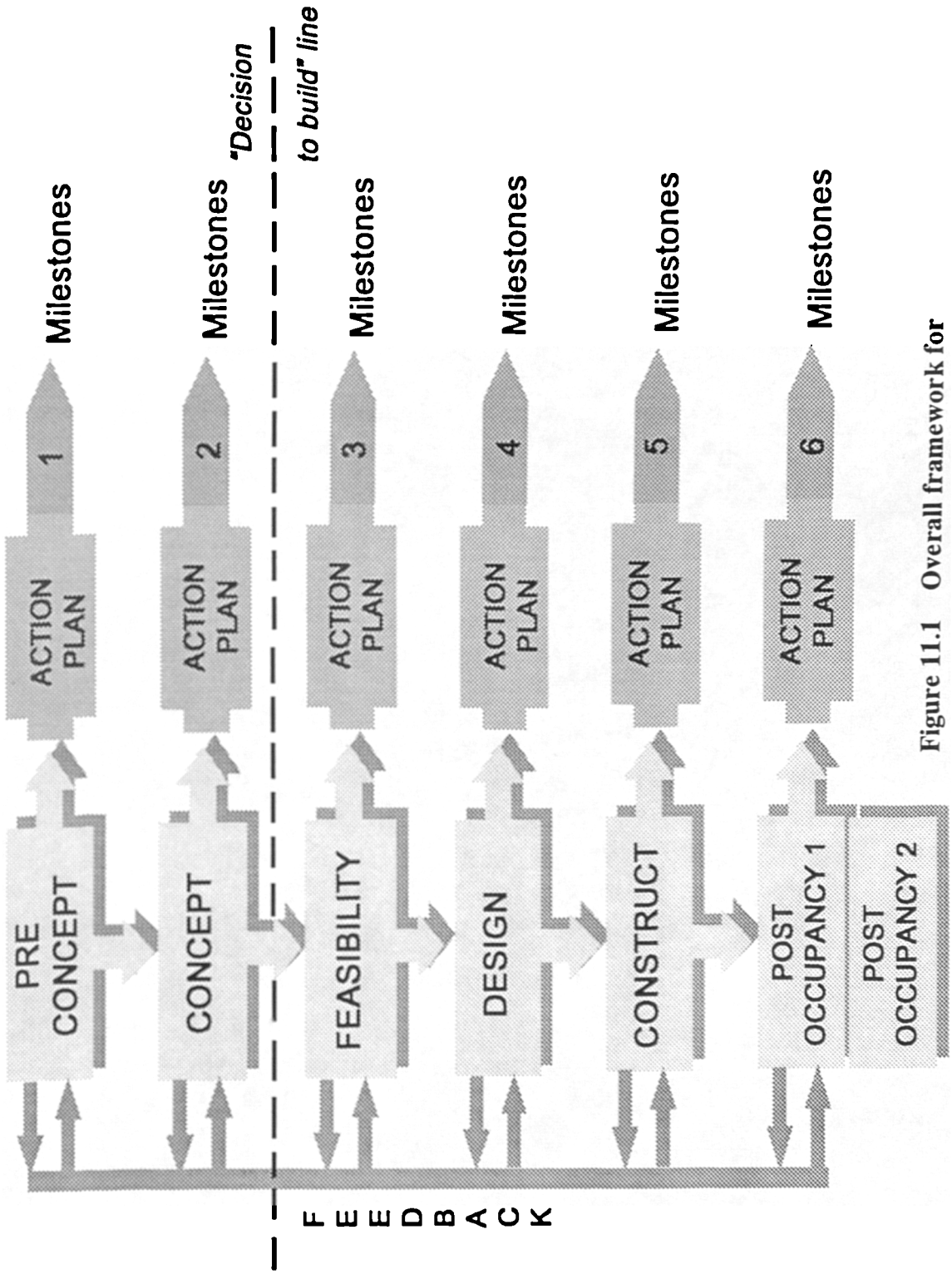


Figure 11.1 Overall framework for Strategic Management of major projects Source: Author 1994

11.3 The strategic management of projects

The project management process can be defined as consisting of two primary phases:

- Strategic phase
- Tactical phase

11.3.1 The strategic phase

The purpose of defining this stage is to make explicit the development function. The strategic phase defines the parameters and objectives of the project to act as a basis for the decision making in the project stages to follow. The strategic phase should be managed by the client organisation in order to fully understand the business objective and the customer requirement and place these within a comprehensive brief for the design team. In order to accomplish this many facets of the client and stakeholder organisation should be pulled together, many avenues and options explored, plans developed and a cohesive agreement reached from all project stakeholders as to the objectives of the project. It is suggested with reference to figure 11.2, that a strategic project manager conducts the tasks in this phase, gradually handing over empowerment to the project manager.

The strategic phase should facilitate the management of a portfolio of projects, balancing them to create maximum value for the business. The development of a master plan should promote understanding and reduce project conflict. The value added during this strategic phase is significant compared to it's cost. Traditionally the time spent in these early stages has been undervalued and thus minimal, due to the intangible nature of the tasks and a drive to get going from the client. This framework defines the actions that should occur, thus making tangible the previous intangibles, and provides tools for their completion. Having established the basis of the project and planned for its execution the tactical phase can be entered.

11.3.2 The tactical phase

The tactical phase is concerned with the active and visible side of construction projects. That is, realising the vision of the stakeholders by designing and creating projects to fulfil their needs. The concepts within this phase are well known, the purpose of the framework is to improve communications, reduce confrontation and enhance productivity. Traditional boundaries are broken down by defining tasks to bind interfaces and improve efficiency.

This stage is made up of the feasibility, design and construction stages. The project manager takes over control of the project once all non building options have been exhausted and the "decision to build" has been made. That is, that management is confident that a building / construction project is the optimum solution to meet the need. The role of the project manager is to manage the interfaces between the design and construction stages in order to complete the project within budget, schedule and to the client requirement.

The strategic project manager then increases his / her input to generate feedback for use in other projects within his / her portfolio. This stage should also review the achievement of value added to the client and feed back lessons to the rest of the organisation through the forum of strategic project management.

It is not the purpose of the strategic project management framework to prescribe the job of the project manager, but to provide him her with the tools necessary to add value to the project process.

The proceeding section will summarise the framework as a series of sub processes designed to bind each of the project stages together to form a complete project process.

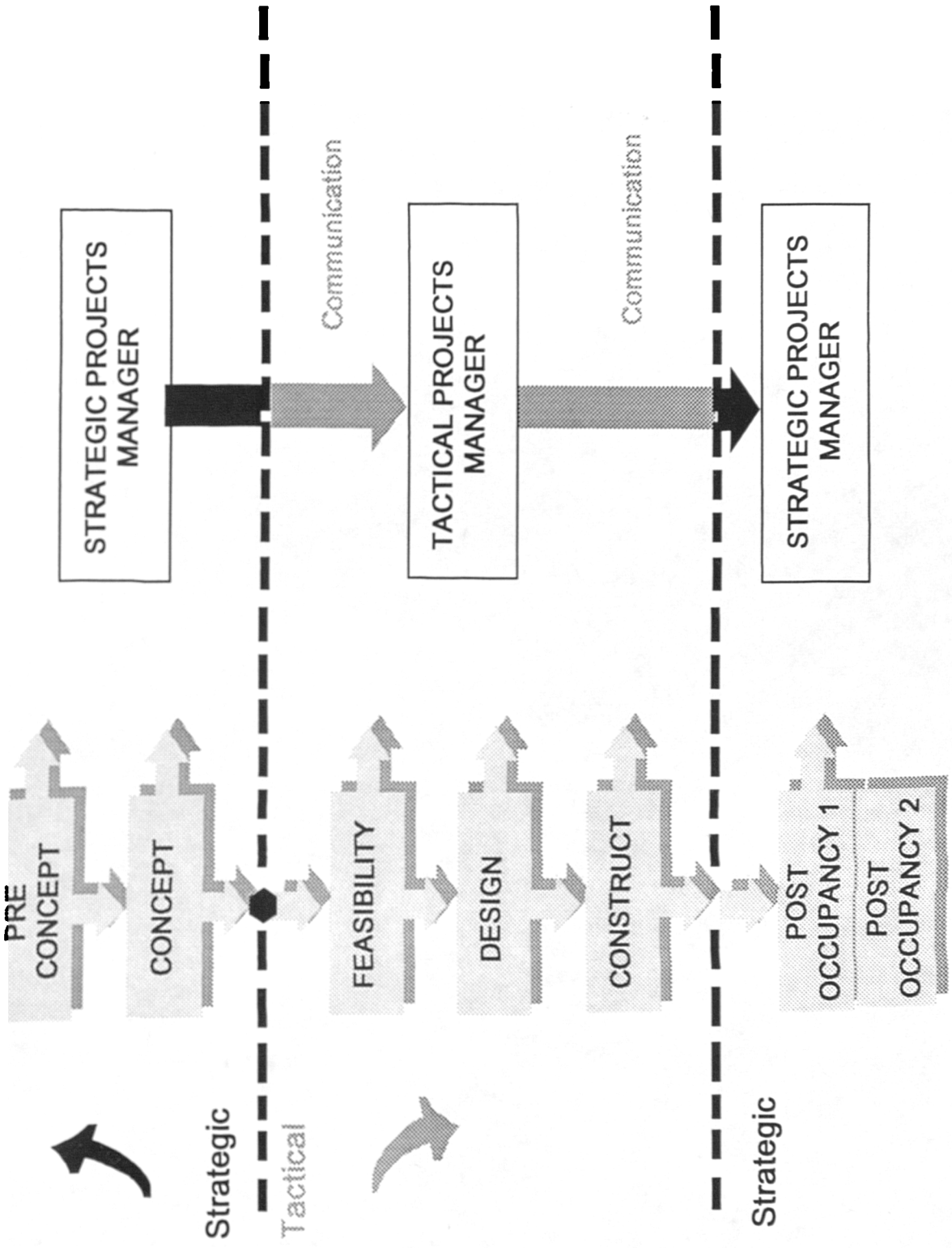


Figure 11.2 Role definition of the strategic and tactical project managers Source: Author 1994

11.4 The project as a set of sub processes

In order to create a smooth transition from one stage to the next, the tasks may be linked into sub processes flowing across the whole project process. These sub processes integrate the project stages and can be described as:

- **Value and objective management** to define the business need ensuring that the project adds value by reducing life cycle costs and increasing benefits to the organisation's customers
- **Design management** to produce buildings of appropriate quality, size and image, fulfilling the customers needs thus enhancing their airport experience.
- **Procurement and risk management** to select the appropriate method of project delivery, managing the risks, developing long term relationships and interfacing project stages.
- **People and interface management** to provide empowerment to allow people to perform of their best, to set up communications channels facilitating a common understanding, leadership and teamwork.
- **The management of construction schedule and cost** to manage the schedule to reduce the project duration where appropriate, increasing productivity and reducing the lifecycle cost of the project. To manage change in the client requirements, monitoring and controlling cost as the project proceeds. Also to plan the construction operations optimising the site logistics, productivity safety and quality. To enhance the interface between design and construction and the specialist trades on site.

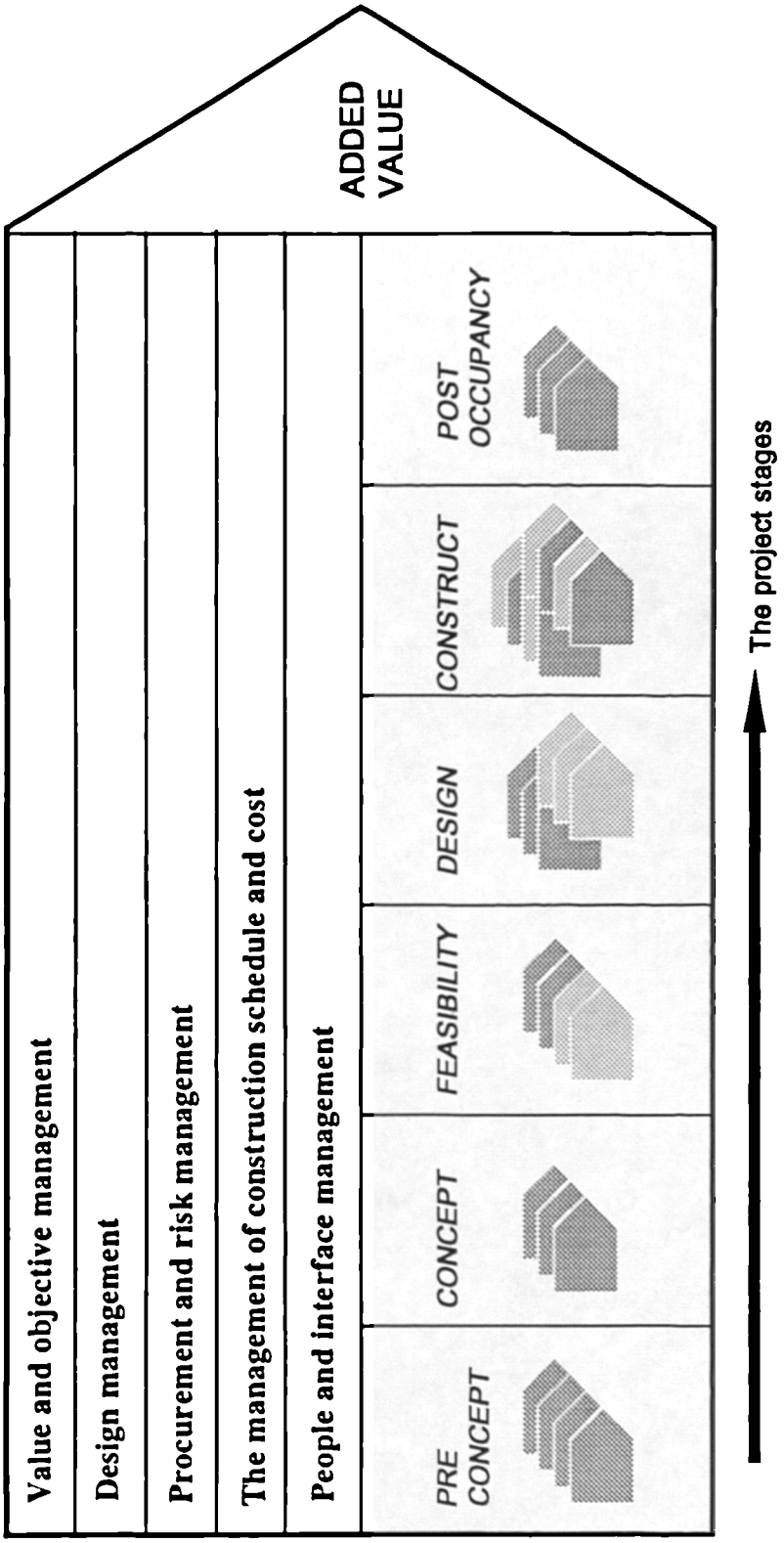


Figure 11.3 The project value chain Source: Author 1994

Figure 11.3 indicates how these sub processes flow across the project stages, linking each progressive stage with the next as part of a value adding process. This has been expanded to indicate the contents of each process in the project value chain (figure 11.4). This acts as a summary of the Strategic Project Management framework and can be and can be explained by the following points:

- The project value chain has been split into the project stages identified in figure 11.1 ie preconcept through to post occupancy. These stages represent the project lifecycle across the total project duration as a series of stages each adding value to the project.
- A summary of the tasks required in order to successfully manage each stage has been input to the project value chain. In this way, by reading down the columns, the project manager can see what tasks are necessary to complete each stage.
- In addition, the project subprocess have been indicated flowing across the project value system. The tasks in each column have been allocated to the sub process to which they belong. In this way the factors that generate success are placed within a process of tasks making up the project lifecycle.

The project value chain acts as a summary of the Strategic Project Management framework, the detail of which can be found within this document.

It is the task of the project manager to facilitate the tasks and the processes in the project to add value at each stage and transfer it to the next stage.

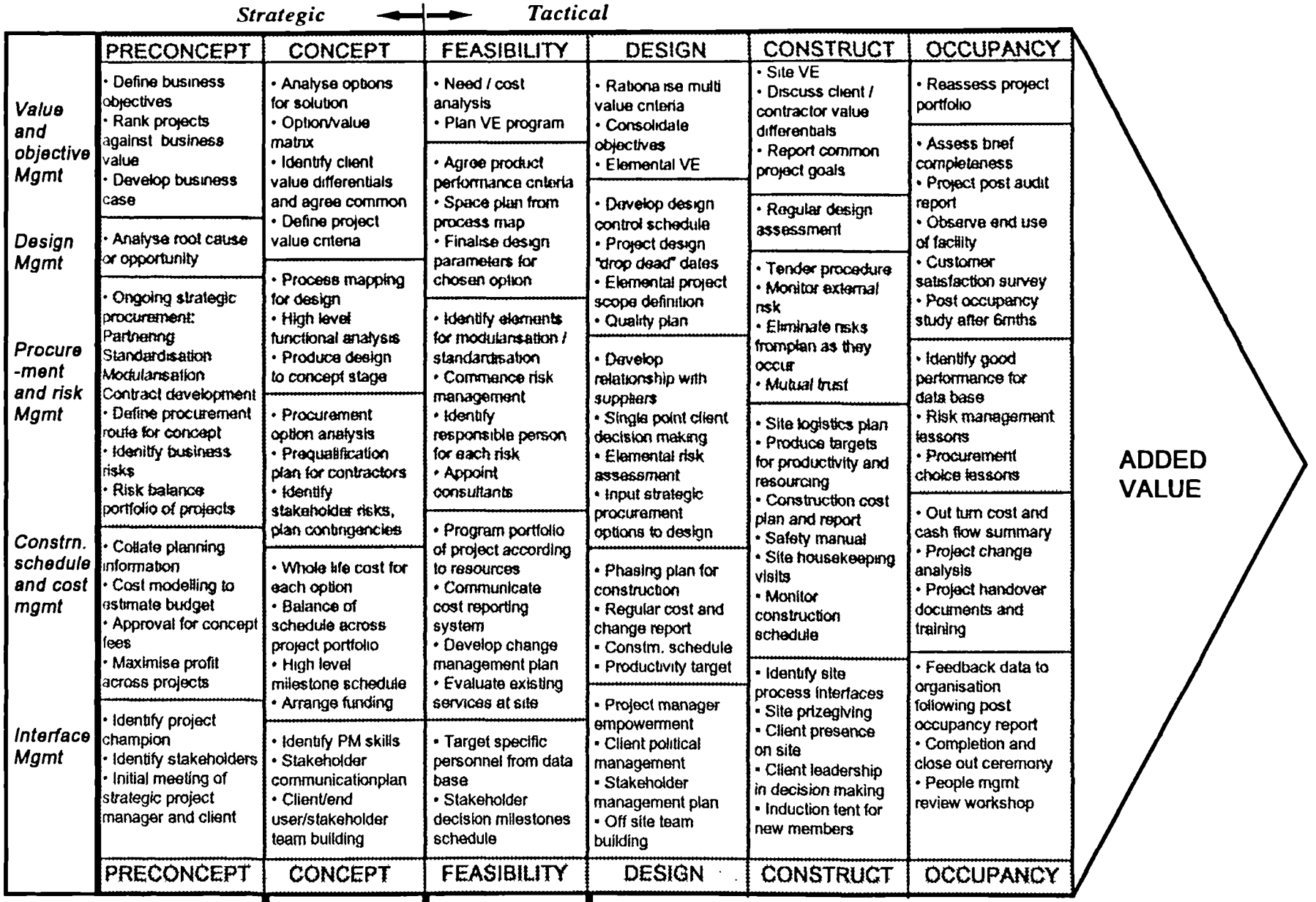


Figure 11.4 Project Value Chain indicating project sub process Source: Author 1994

11.5 The project stage checklists

Having presented the context of the strategic project management framework, this section will define the checklist of tasks and brief contents for each stage of the project process. The guide will present the following information for each stage of the project process in a sequential manner:

- Milestone tasks signifying the completion of that stage
- Checklist of tasks for completion at each stage
- Checklist of contents for each iteration of the project brief to suit the stage in the project.

For each stage in the project process the project manager may refer to these checklists to provide him/her with the information necessary to cover the factors for project success, ie those factors deemed critical for the success of the project. Building upon the summary diagram, section 11.5 will take each stage in turn and define in more detail the tasks required at each stage.

The Preconcept Stage

Milestones for preconcept stage:

Portfolio report

Concept approval

Assignment of project objectives

Identification of business objectives

Strategic brief

PRECONCEPT TASK CHECKLIST Table 11.1	*DEFINITION: At the preconcept stage the project exists as a problem or an opportunity. The purpose is to open communication channels to ensure those necessary are involved in the project investigation and definition*	
Analyse the root cause of the project, ie define the true need by process of brainstorm and analysis		
Define business objectives: Define and agree the value criteria, ie those elements considered to add value to the business. These will act as the focal point for the development of the project.		
Conduct portfolio analysis: Rank projects against business value criteria, risk balance portfolio of projects and maximise profit across projects.		
Assess non airport projects within the airport portfolio to ensure planning coherence.		
Ongoing strategic procurement awareness: Partnering efforts, standardisation of components, modularisation of design, common contract development etc.		
Define procurement route for concept design		
Identify business risk associated with solving the problem identified		
Collate planning information		
Cost model number of options to develop magnitude of cost estimate		
Define the customer and source any relevant information to support the need and define the customer requirements.		
Identify the project champion and the likely participants to the project, ie the identifiable stakeholders at this stage.		
Hold initial meeting of strategic project manager and client		
Produce the strategic brief and issue to the following once signed off by the project owner: ·Project Champion ·Strategic Project Manager ·Representatives from procurement, design and other central departments who are considered to have a strategic input ·Influential Stakeholders.		
Develop business case and seek approval for concept fees		

STRATEGIC BRIEF Table 11.2	To produce a cohesive understanding of the project goals, scope and budget, reporting structure and the basic schedule requirements.
AUTHOR:	APPROVAL:
☐	The owners overall business mission
☐	Statement of the real problem that the project must address
☐	The financial impact of the project on the business
☐	Operational impact of the project on the business
☐	A statement of the corporate value criteria and how this project aligns with these
☐	A prioritised list of the project objectives alongside the problem they hope to address
☐	A list of the possible stakeholders of the project/problem
☐	Value Management plan
☐	*Project managers report*
☐	
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PROJECT MANAGERS REPORT

- Consider portfolio of projects within the clients business and prioritise according to the business needs
- Definition of success for the project
- Results of brainstorm of alternative means to achieve solution other than building
- Definition of client, end user, project manager, and customer
- Brainstormed list of strategic procurement issues
- Brainstormed list of high level business risks

The Concept Stage

Milestones for concept stage:

Prioritised definition of value for money

Client / stakeholder management plan

Procurement matrix and risk report

Project option lifecycle cost report

Concept brief

CONCEPT TASK CHECKLIST Table 11.3	*DEFINITION: At concept stage options for the optimum value solution of the problem are investigated. The project team grows to develop basic space planning concept solution.*	
Analyse the function of the project by taking the definition of the real problem and walking through the process the project needs to accommodate. That is, develop a process logic diagram or flow chart		
Produce number of options for the solution of the problem or realisation of the opportunity.		
Refine value criteria to reflect the specific needs of the customer group. Identify client value differentials and agree common objectives.		
Assess each option relative to the value criteria established, this is best conducted by the use of a matrix.		
Consider whole life implications of each option		
Finalise project concept according to the information in the decision matrix.		
Once the final concept has been chosen the procurement options require investigation. There are a number of matrix tables that can be used to assist this task but the following should be considered: ·Feedback from prior projects ·Priorities for this project in terms of time, cost and quality ·The risk the owner is prepared to accept ·The use of contractors with whom there is a long term relationship		
Develop prequalification criteria for choice of contractors		
Develop a high level milestone schedule detailing key dates to be met by the owner, designers and the project team. This should highlight the need for decisions to be made at set times as well as deliverables from the design and project teams.		
Identify stakeholder risks and develop contingency plans for their occurrence		
Develop cost plan to + - 20% (according to BAA policy)		
Discuss the funding issues associated with the project portfolio with finance and begin the funding debate via property finance departments as required.		
Identify project manager skills required for this project, choose PM and gradually introduce to the project issues and decisions		
Develop communication plan for the project detailing communication networks, stakeholder management plan, interface management plan.		
Conduct a team building exercise for the client end users and stakeholders		
Produce a concept brief from the information generated from this stage.		

CONCEPT BRIEF Table 11.4	To produce a statement of the project scope and broad design information to allow the project team to generate alternative schemes for the overall organisation of the facility and layout of spaces.
AUTHOR:	APPROVAL:
☐	A statement of the scope of the project. Detail concept solution chosen
☐	A statement of specific functional requirements from the end users
☐	Schematic representation of the function of the project in the form of a flow chart
☐	Projections of future requirements in terms of space, capacity, tenant information etc.
☐	Interfaces between the end user requirements and activities
☐	A statement of the base design criteria and required design quality
☐	Broad space planning
☐	Project targets requirement
☐	Miilestone schedule detailing key dates to be met with documentation & decisions
☐	Establishment of operational constraints and considerations
☐	*Project managers report*
☐	
☐	
☐	

PROJECT MANAGERS REPORT

- Summary of alternative options considered and reason for final choice of solution
- Assess main options relative to value criteria established in strategic phase
- Definition of major interfaces and dependencies with other projects
- Develop cost plan +/-20%
- Critical issues to be resolved and those responsible
- Project organisation identifying the players and their communication paths
- A Stakeholder management plan
- Procurement options and chosen option plan
- Funding strategy
- Client change management plan
- Detailed prequalification plan
- Evaluate existing services at site location

The Feasibility Stage

Milestones for feasibility stage:

Project approval

Risk management report

Decision schedule

Approval for choice of consultants

Performance brief

FEASIBILITY TASK CHECKLIST Table 11.5	*DEFINITION: This stage refines the level of information to check the feasibility of the chosen concept under varying capacity and design conditions. As the scheme design develops the cost should be refined to +/-10% (BAA policy)*	
Assess the options resulting from a feasibility study against the project value criteria in order to fit the solution to the requirement. This will enable the specific option to be finalised so that the size, capacity, flow parameters etc. are chosen according to the need and customers definition of value for money.		
Conduct need cost analysis in order to make the owner aware of the cost of each of the needs requested in the final option for design development.		
Specific requirements for the performance of the product should be worked up within the team of stakeholders, maintenance representatives, design team, suppliers and construction personnel where possible.		
Identify elements for central procurement		
Conduct a risk analysis exercise to reduce the uncertainty and assign a probability to the likely occurrence of unknown and known events. Identify responsible person for each risk element.		
Plan Value Engineering procedure for the remainder of the project to suit the specific nature of the project.		
Appoint consultants having sought approval from appropriate directors		
Investigate suitable personnel and specific managers from within organisations for the design and construction stages of the project. In time a record of "suitable personnel" could be built up. The task will be achieved by people not by organisations and the choice should be made on this basis.		
Communicate cost reporting system and develop a change management plan		
Pull together a team consisting of the project management team, design and construction team, stakeholders and owner to brainstorm the project on paper before entering the design process. The product at the end of this process will form the concepts and issues report to be endorsed by all participants to the project process. This base will form the start of a rolling process to update the concepts and issues report as the project progresses and uncertainty is reduced.		
Program portfolio of projects according to resources		
Develop stakeholder decision milestone schedule		
Evaluate existing site services and conditions		
Seek approval from the board to proceed with the design and construction of the chosen solution.		

PERFORMANCE BRIEF Table 11.6	To facilitate translation of the client requirements into a well defined cost effective building design in terms of size character and performance
AUTHOR:	APPROVAL:
☐	Complete description of functional requirements of the facility
☐	Space planning in accordance with the flow chart produced at concept stage
☐	Performance requirements of the electrical, mechanical, plumbing services
☐	Size of the facility in terms of passenger/baggage throughput, staff resources, etc.
☐	Specific operational requirements for height, noise reduction, lighting, safety, etc.
☐	Required quality levels: Building systems and special materials required
☐	Location and site access details
☐	Room data from the end user
☐	Program with milestone dates for client and end user decisions
☐	Statement of specific project value for money
☐	Statement of materials procurement requirements eg. central purchase items, life cycle costing information, standard items, modularisation requirements etc.
☐	Value Engineering plan for the design process
☐	*Produce concepts and issues report: This is done by brainstorming issues from start to finish of the project with all members of the project team in order to table underlying problems and raise awareness of the need for decisions to be made.*
☐	

CONCEPTS AND ISSUES REPORT

- Materials options
- Permits
- Utilities temporary and future
- Procurement
- Access
- Phasing
- Demolition
- Security
- Safety
- Owner operations impact
- Working hours
- Community relations
- QA/QC
- Value engineering
- Schedule
- Preliminary Cost Estimate
- Bid packages
- Site constraints
- Parking
- Interfaces
- Design issues
- Document coordination

The Design Stage

Milestones for design stage:

Milestone design schedule

Change management plan

Regular cost / risk report

Design interface report

Technical design brief

DESIGN TASK CHECKLIST Table 11.7	*DEFINITION: During the design stage a multitude of professionals will join the team to realise the client requirements through management of design interfaces. Decisions should be based upon the project objectives as defined in the previous stages.*	
Maintain single point of contact through the PM with a suitable level of empowerment for decision making.		
Rationalise multi value criteria and consolidate with project objectives		
Produce design schedule with the design team detailing "drop dead" milestones and decision milestones. The communication, ownership and adherence to this schedule should ease the design management. The labour resourcing should then be monitored to ensure that the design effort is strong enough to meet these schedules.		
As design develops identify the construction risk associated with the important elements and assign someone responsible for managing that risk		
Input strategic procurement issues into the design.		
Develop quality plan		
Define project scope for each member of the project team to manage interface		
Conduct regular Value Engineering sessions in addition to promoting a value engineering philosophy into the design team.		
Communicate the project vision to each new design member to the team.		
Report the cost plan update regularly detailing any shifts and design change orders. In this way the post project feedback will be able to report the cost implications of all changes and from whom they arose.		
Develop phasing plan and program for construction to minimise operational disruption.		
Ensure client and stakeholder ownership of the design solution, through stakeholder management system. This will involve recognising , communicating and managing conflict and political power sources.		
Involve the whole team once established in a team building exercise off site to encourage understanding and a sense of belonging.		
Revisit the concepts and issues schedule on a regular basis to reduce the number of uncertainties and ensure all issues are considered. This will also assist the constructibility study during the design process.		
Produce final documentation for construction details utilising knowledge from the best sources. This will include involving the suppliers, manufacturers and subcontractors in the design process. As relationships are built the contractual effort behind this process will reduce significantly.		

TECHNICAL DESIGN BRIEF Table 11.8	To detail the design character, layout of individual rooms, occupancy requirements, building services requirements and the actual construction details.
AUTHOR:	APPROVAL:
☐	Detailed scheme design and space planning
☐	Complete coordinated construction drawings
☐	Complete specifications where necessary
☐	Bidding documents
☐	Construction phasing plans
☐	Final cost estimate
☐	Productivity plan for site work
☐	Logistics summary for site work
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CONCEPTS AND ISSUES REPORT

- Materials options
- Permits
- Utilities temporary and future
- Procurement
- Access
- Phasing
- Demolition
- Security
- Safety
- Owner operations impact
- Working hours
- Community relations
- QA/QC
- Value engineering
- Schedule
- Preliminary Cost Estimate
- Bid packages
- Site constraints
- Parking
- Interfaces
- Design issues
- Document coordination

The Construction Stage

Milestones for construction stage:

Regular project status report

Health and safety record report

Site productivity monitor

Cost and change control document

Handover report

CONSTRUCTION TASK CHECKLIST Table 11.9	*DEFINITION: The construction stage results in the physical realisation of the facility encompassing the work of various trades and the management of their interfaces. This stage represents the maximum escalation of cost.*	
Identify client/contractor value and objective differentials, discuss and reach common understanding of the project objective whilst facilitating a compromise of individual objectives.		
Develop construction schedule with the construction team, producing targets for productivity and labour resourcing. This will enable the client to predict problems and monitor resourcing on site.		
Encourage construction site based Value Engineering on elements and processes to input knowledge from the personnel responsible for the construction task.		
Produce site logistics plan for efficient movement, storage and delivery of material and human resources on site.This should be conducted for the individual project and across the portfolio of projects.		
Report briefly on site progress to main stakeholders on a regular basis, assisting management of change and ownership of problems as they occur.		
Eliminate sources of risk from the risk schedule as they occur and the project is realised. Sources of external risk should constantly be monitored during this stage to act as a buffer between the external environment and the construction process.		
Visit site regularly to maintain high standards of site housekeeping and client presence on site.		
Identify key personnel and process interfaces, monitor these and attempt to reduce them by management and leadership.		
Open and maintain a safety file		
Regularly assess quality of construction with design details.		
Regularly report the schedule and cost plan as developments occur.		
Prepare induction workshop for new members to the site team such that they are aware of their contribution to the overall project vision.		
Arrange prize-giving ceremonies for good performance to increase motivation.		
Ensure client leadership in decision making whilst maintaining mutual trust.		

The Post Occupancy Stage

Milestones for post occupancy stage:

Post audit report

Learning points implementation plan

Training implications report

Individual recommendations for developing relationships

POST OCCUPANCY TASK CHECKLIST Table 11.10	*DEFINITION: This stage can be considered as a two stage process, learning from immediate project results and failures and learning from long term value assessments of the facility in operation.*	
The start of this stage is represented by project completion. In order to officially close the project a project close out ceremony is recommended.		
Produce project handover documents for client / end user.		
Produce project post audit report detailing the immediate issues that arose and recording those team members that worked well and would be recommended for use again. This report should ideally include feedback on the suitability of the project delivery method utilised.		
Produce out turn cost report detailing the source and implication of any cost increases and changes during the projects duration.		
Assess the standard of the project briefing process, this would best be conducted as a team between the designers, construction team and the project management team.		
A risk report should be produced as feedback to identify the problems that arose and whether they had been identified in the risk management exercise that took place. In this way a database of information for common problems and issues can assist future risk management exercises.		
A review session with representatives from all sections of the project organisation should be conducted to highlight successes and failures in the people processes and management issues.		
Collate information from post project reports and produce in a format suitable for feedback throughout the organisation: Containing key learning points regarding procurement route, risks, project personnel, cost reports, site management techniques.		
It is important that the successful elements of the project are recognised and recorded. This should be conducted with reference to the initial definition of value for money for this particular project.		
Conduct people management and interface review workshop.		
For significant projects, at a time when the occupants of the new facility have settled, it would be useful to revisit the project and assess the functionality and quality of the design. Techniques such as questionnaires, surveys and observation could be used to test the occupants' perception and use of their new facility. The results of this process should then form part of the feedback process to the whole organisation in terms of the original requirement.		
Reassess project portfolio to account for completion of this project and the business value realised.		

11.6 Tools and techniques

The following section presents a summary of the tools and techniques that may be used to achieve the tasks in the project checklists. These are meant as a guide to the project manager only, there are many other tools that may be used to accomplish the required milestones. The tools highlighted in this section represent those not particularly well utilised or those new to the field of construction projects.

Portfolio Management analysis

Ranking according to corporate objectives (Souder, 1988; Angling, 1988; Gareis, 1992)
This involves listing the corporate objectives for all stakeholders in the client organisation vertically down one side of a matrix. Along the horizontal axis are listed the projects in the portfolio for analysis. The projects are given a score for fulfilment of each of these corporate objectives maybe between 1 and 10. This crude measurement is not empirical simply an indication of the degree to which the objective will be realised. If any of the corporate objectives are particularly important then they may be weighted to increase their impact. By cross multiplying the matrix each project is allocated a "score". This assists the strategic project manager in his analysis of the most suitable projects.

Corp Obj	Rank	Project A	Project B	Project C	Project D
1 2 3 4 5 . .					
Score					

Figure 11.5 Ranking projects according to corporate objectives

Graphical risk balancing (Gareis, 1992)
This method allows the SPM to map out the risk levels across the project portfolio. Each project is given a high or low risk score across the phases of the project. The projects are added to a graph against time to indicate any areas of high overall risk. This may indicate times when the projects expose a terminal to high levels of disruption all at the same time, or if there is a risk of a project overrunning into another in the same area. This allows the SPM to highlight conflicting areas of risk and so shift projects in order to reduce overall risk or draw attention to the high exposure and develop contingencies to cope.

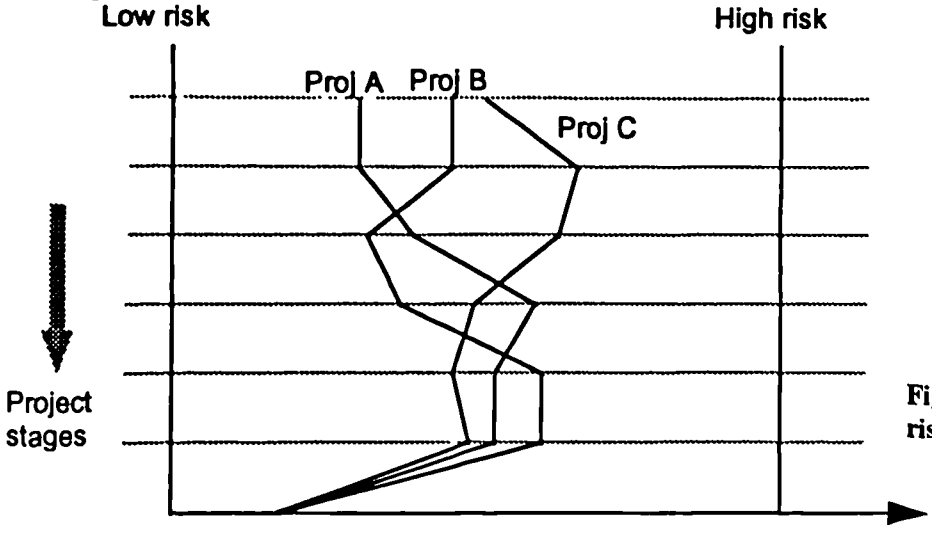
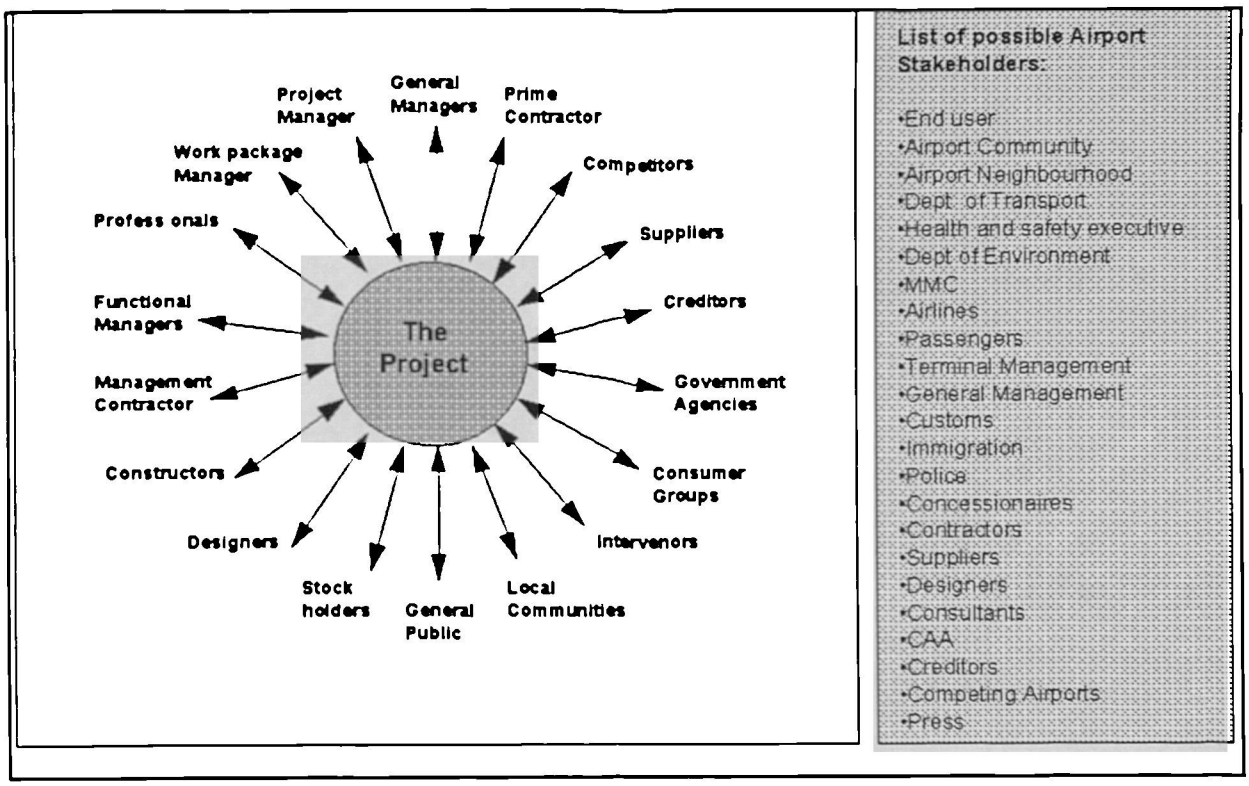


Figure 11.6 Graphical risk balancing

Profit maximisation across projects holistically (Souder, 1988)
This analysis relies on the holistic analysis of project portfolios and looking at the returns from each project dependent upon the level of funding allocated. It may be that project x will give a significantly higher return with a higher investment whereas project y will not suffer significantly with a reduction in investment. This method allows project investment to be balanced for optimum overall return.

Risk management analysis

Stakeholder identification chart and communications plan (Cleland, 1986)
Various charts of the possible stakeholders to a project exist from which the stakeholders can be identified and categorised according to their input. For each of these stakeholders it should be possible to identify a list of objectives. For those objectives conflicting with the project objectives it is necessary to set up communications to resolve the conflict and choose a mutual route to fulfil as many objectives mutually. If this is not possible it is necessary to communicate those that are still existing, predict the possible behaviour of the stakeholders and allow for contingencies. It is important that this process continues as a rolling process to capture new stakeholders as they arise.



Structured risk management table (McKim, 1992)
This is a process through which risk is identified on a project and allocated a probability. The method can be conducted on a qualitative or quantitative basis. A table is developed indicating the risks on the vertical axis and the cost implications along the horizontal analysis. The benefits of conducting a full quantitative analysis have been questioned, but to go through the analysis brings to mind the risks that may occur.

Risk	Nature	Time	Probability	Cost	Contingency plan
A B C D					

Figure 11.8 Structured risk management table

Procurement risk matrix for choice of procurement route (Singh, 1990)
This is a rational procurement decision analysis based on a multi attribute technique. A matrix exists, developed from historical records of performance of various project delivery methods, giving the comparative performance of different contracting systems. The project team must simply fill in the matrix: Take table of listed and weighted factors and assign priorities for the project in question. Multiply across the table of factors and weights, giving a score for each project delivery method. This can be used to rank the project delivery options for discussion and further analysis. It is dangerous to use this model empirically as the figure in the table have been developed from historical data, however it may be possible to update these figures. See sheet attached.

Value Management tools

Value management and value engineering workshops
This may take many forms from short charrettes to 40 hour workshops. A balance must be made between the time required for the 40 hour workshop and benefit gained. It is important that a program is developed and a forum exists for learning from the findings of each VM exercise.

Process mapping
This mapping generates a process diagram of the building under development. It allows the project team to think through the processes required in the building, their interrelationships, their space planning and the constraints to the layout of the building. This mapping will facilitate the brief development and allow the team to fully understand the nature of the building. The development of the interrelationships between functions and processes may highlight common facility requirements, so dictating the layout of the facility.

Brainstorming project and corporate value criteria
By brainstorming the corporate and the project value criteria a definition of value for money for this particular project is realised. The project value criteria should be an extension of the corporate value criteria and arranged in a progression or tree of objectives leading back to the ultimate mission of the project. It is important to communicate this objective tree to all parties to the project process. As each new member of the team arrives it may be suitable to walk them through the reason for the project by using this analysis.

Client need/cost matrix (Dell 'Isola, 1982, Ellegant, 1989)
Having identified the clients objectives it is necessary to specify what this means in the form of a brief. In doing a list of project needs and wants will be developed from various stakeholders to the project. By listing these it will be possible to (A) highlight any conflicts between stakeholder's needs, (B) identify common needs and then combine into mutual areas of need (C) assign a cost to each need indicating the value for money achieved. This latter point may be produced in the form of a matrix of needs against cost; this may form the basis for discussion of possible cost reduction of those needs not considered worthy of such high expenditure. A further column to the table may be added for alternative solutions to the need for those which are considered to high in cost.

Post occupancy studies (Kirk, 1989; Preiser et al, 1988)
These are appropriate in two stages: one immediately after the project to learn from the project management successes and problems, the second once the building is well into occupancy. The first of these reports should encompass brief interviews with the project organisation and stakeholders to establish the success of the project in terms of the original objectives. This should form the basis of feedback to the organisation for review of the project management processes where necessary. The second post occupancy report may only be appropriate for large or sensitive projects. The site should be revisited and observations, interviews, discussions, questionnaires conducted to rate the satisfaction and conformance to the original brief. The investigation should identify areas of low functionality, low use, redundancy or poor condition. This may be used for future design decisions of similar projets and also for post project alterations to the project under review.

Cost and Schedule management

Common cost reporting and change management chart
A proforma for use on all projects identifying the costs as they develop, the change requested from where it originated, a short report on the cost and other implications of making the change and the reasons for a change to the original brief.

Lifecycle report on options for project and elements
An estimate of the lifecycle costs of each option should be submitted at the earliest stage for approval. The options should be selected with these lifecycle costs in mind. In addition to this the design should commence with the lifecycle costs of each major item being reported for future records.

Iterative milestone scheduling (Janzen, 1992)
To facilitate up front planning and scheduling to meet specific project needs. The sequence of events as the project progresses are:
Identify the business needs
Level 1 Milestone schedule developed
Owner needs identified
Execution strategy developed
Level 2 Project schedule developed
Level 3 Design control schedule developed
Level 3 Construction schedule developed
In achieving this schedule the major review points can be highlighted by the clients early on, this forms the basis for the schedule and ensures that the business needs are met through the project. Follows three stages: determination of needs, determination of scheduling systems, performance assessment and schedule monitoring.

Schedule with client/stakeholder decision milestones
A schedule can be developed identifying the major decision points for the stakeholders involved in the project, after which the project schedule will slip. The responsibility for the schedule is therefore placed on the client and stakeholders where appropriate. This increases ownership of the project schedule and emphasises the importance of particular decisions.

People management

Project scope defined for each project participant (Kraus and Cressman, 1992)
At an early point in the project it is vital to identify the scope of each persons duties. This includes the client members, stakeholders and the professionals and contractors in the project. This involves a number of levels of scope definition: The project scope should be identified such that the objectives of the project are defined and the project does not grow to engulf others objectives. Having defined the project, the next stage is to define the areas of the project to be controlled by particular members of the project organisation. This then forms part of the project documentation.

Communication of the project vision to the construction team
It is often the case that the construction organisations and subcontractors arrive on site for the duration of their work unaware of the interface they must form with other parties to the construction process. In order to overcome this it may be appropriate to develop an induction tent, whereby each new site worker is walked through a vision of the future. The ultimate product is shown to increase the ownership and motivation of the site workers. The interdependencies between trades are shown, the program and phasing of the works and site logistics plan. In this way the site worker understands his her input to the overall product.

Database of exceptional personnel
As the project proceeds a record should be made of excellence in performance such that a database of personnel can be developed. This will lead to a situation where particular personnel can be identified for project from within other organisations. This allows good performance to be rewarded and future projects to benefit from the experience gathered on previous projects.

Client/end user/stakeholder team building and
project team building (Morris, 1989)
Team building techniques are appropriate where particular conflicts may arise during a project. The team building processes allow the team to relate to each other on a personal level, resolving conflicts and problems amicably and with trust. If during the team building process it is found that personalities clash, then it may be possible to request replacement of that particular member of the team for another. The team must be able to relate to each other during the project duration.

Site management techniques

Site logistics plan for movement, storage and access of materials etc
Logistics has to do with total system design, integration of one process with another, system efficiency, deployment of resource, and above all, the management of time. This relies on management of the supply chain, the arrival, processing and waste of materials to site. The management of resources and the phasing of the site. This may be conducted by a number of means, but the important thing is that it is done by the managing contractor, under the knowledge and experience of the client. The Japanese use a system of Kanban relying on the just in time philosophy used in manufacturing plants. Material arrives to each work space just in time and the build up of material is avoided. It does however rely on careful timing of delivery to site. In Japan the materials are delivered within a two minute window to manufacturing plants on a daily basis. Investigations are required into the logistics plans available for site management by the contractor together with the client.

The "next position is customer" philosophy of the Japanese also works well for site management where each tradesman hands over to the next as if it were his customer. Good site practice and cleanliness develops from this philosophy and leads to pride in work.

Standardisation also adds to the logistic plan as time to site and time to customer is reduced. Design for construction philosophy allows the logistics and site construction to be considered during the design process, requiring input from construction organisations early in the project process.

Completion ceremony

This simple ceremony marks the end of the project on site and the start of occupancy. It should be used as a thank you ceremony for completion of the whole project or simply phases of the project. This motivating force adds weight to the completion of the project and the personal responsibility of each member. It acts as the close out for the project manager the time at which he/she may move onto another project.

Safety manual and initiative prize-giving

Safety is obviously high on the agenda for an airport operator, but may not be for each individual on site, it is therefore useful to guide the site members toward safe site working and use problems to build up a site safety diary. In this way good practice is rewarded with a prize-giving and poor safety is made an example of. Site safety does add cost to projects so should be recognised as a cost item. In response to the CONDAM (CDM) regulations the designer should be made aware of their responsibility to design safe buildings not only to occupy but also to build. A safety file should be established at an early stage in the project to record decisions made regarding safety and design costs associated with safety.

Site value engineering (Baba, 1990)

Small value engineering exercises either for 10 minutes at the start of a day or 30 minutes at the end of a week for example, have been shown to improve site working practice and highlight design faults. The personnel on site are the closest to the work going on, they should be encouraged to challenge poor design and bad workmanship. Solutions to minor problems and alteration should be allowed by these VE workshops on site. Documentation should come from the site supervisor for the records of the client.

11.7 Summary

This chapter has presented the strategic project management framework as a stand alone document for use by project managers. The context was initially set by describing the aims of the framework and it's intended use. The importance of the strategic emphasis was described allocating the strategic tasks to the strategic project manager and the tactical project tasks to the project manager.

Having defined the context, the chapter continued by presenting the task and brief checklists for each stage in sequence such that they could be referred to independently. At each stage the project manager is encouraged to consider the required milestones to mark completion of that stage; the checklists encompassing the critical success factors and the list of contents of the appropriate brief iteration .

Finally recommended tools and techniques are presented as an appendix to the framework. This chapter draws together the comments, inferences and conclusions highlighted in chapter 10 into a useable, value adding project management process.

12 INTRODUCTION

This chapter is presented in three main sections. The first section will conclude the main characteristics of the model that has been developed for the strategic management of major projects. The second section will discuss the implications this holds for the UK construction industry. Finally the thesis will conclude with recommendations for future research to further develop the field of study.

12.1 The strategic management of major projects - a summary

Having developed a case in chapter two for an airport organisation to be defined as a business enterprise rather than simply a transport node, it was suggested that the future development of BAA plc relied upon a customer orientation through investments delivering value for money to the customer. The discussion in chapters three and four unveiled the way in which projects can be considered as a means to implement the corporate strategy and hence place an organisation in a position of competitive advantage. It became apparent that project management has for many years been considered in relative isolation from the organisation's strategy, leading to projects that do not fulfil the customer's expectation. A project continues to have effect long after the completion of construction. The investment in a construction project only becomes valuable once it is in use, with the inference that project management should look forward into the life cycle of the product as well as the project. It was concluded therefore that any model for the management of major projects was a strategic concern and should be rooted within the corporate objectives of the client organisation. The model therefore evolved as one for client strategic project management combining environmental interaction to discover the customer's interpretation of value for money, with tactical control to successfully implement the project.

Concluding that value is a personal interpretation, chapter three discussed the need for a unique interpretation of value for each individual project. Having defined value for money, a process must exist to filter major decisions, recognising conflicting values, as the project develops in order to realise a valuable project on completion. The

project value chain, described in chapter five, forms the link between the organisational processes and the individual project, indicating the complex interfaces that must be achieved across the project lifecycle.

The final model facilitates these processes by describing a series of stages interlinked by a communications and interface plan, describing the early stages as having a strategic orientation, compared to the traditional control orientation of tactical project management. The project management process has been described as a series of sub processes interacting to add value to the project. The processes each span the project lifecycle, challenging the typical interpretation of time related actions. The model presents these actions as processes, gradually evolving as information and detail becomes available and certainty increases.

The model has incorporated the critical factors for success, described in chapter six, with international best practice to produce a set of task checklists, one for each stage of the project process. The project manager is encouraged to use these as a guide to the required tasks in order to add value at each stage of the project value chain. The early strategic stages of the model form the interface between the client's strategic management process and the management of a series of projects. Having completed this analysis the model establishes the base criteria for the project. The tactical stages of the model define tasks and outputs to implement the project successfully. This facilitates management and control of the human and process interfaces.

The thesis has introduced the strategic project manager, a role to fulfil the strategic element of the model. The strategic project manager will be responsible for the management of a portfolio of projects, balancing resources, ensuring strategic fit and assisting the project manager in building up the concept for the design solution. The interface between the strategic project manager and the tactical project manager is described as a handover of empowerment once the decision has been made that a building project is the optimum solution.

Chapter five highlighted the particular impediments to value across the construction project value chain, concluding that management of construction projects suffers from poor communication and complex interfaces. The definition and communication of project scope is paramount in the early stages of a project to ensure that a thread of value messages forms the core of the project decision making. For this reason the model describes in detail the development of the briefing document in iterations, providing a checklist of contents for each stage of the project process. The holistic nature of the model allows feedback within and outwith the model to filter decisions and learning points throughout the organisation.

The model has been developed within an industrial setting, using the views of those intimately associated with construction projects and thus aware of the real problems that arise within a complex environment. The freedom of data collection within the sponsoring organisation exposed personal views and explicit information regarding the problems of construction in the UK. It is for this reason that the model is considered to be robust and applicable to real life projects in the client organisation seeking business value from the construction process.

In order to implement the model successfully the project organisation must accept the philosophy of value for money. The historical interpretation of value for money in construction has been low cost at the expense of quality. To overcome this misinterpretation the model has been presented as a philosophy of value. The parties to the project are encouraged, through implementation of the tasks and checklists in the model, to add value in their own way but based upon the customer perception. This has a significant impact upon the existing paradigms within the construction industry as historical roles and relationships are challenged.

12.2 The challenges for BAA

Having defined a common approach for the strategic management of projects, BAA plc must respond to a number of challenges in order to transform their culture:

- The organisation of project management within BAA plc
- Developing of partnering arrangements and central procurement
- Mobilising a cultural shift from capital cost to lifecycle cost in all aspects of project approval and development
- Understanding the business of their customers' and responding by exceeding their expectations
- Nurturing common goals with stakeholders
- Developing a culture of communicators and people managers

The thesis has highlighted the need for BAA plc to implement a framework for the strategic management of projects. This requires a shift in focus for the organisation and also a response from the industry. The construction industry must enter a period of radical change, in which the old paradigms are removed and new ones developed.

12.3 Implications of the research for the construction industry

The model is presented for use by the project manager in assisting management of the project from within the client organisation. However, the implications of this are far reaching, extending to the suppliers, contractors and deep within the client organisation. The evolution of the construction industry must enter a period of revolution as the barriers between the participants to a construction project are broken down. The research has drawn contradictions between the objectives of the clients and those of the service providers.

In the first instance the concept of trust must enter construction projects as risks are shared and communications opened. The achievement of value can only occur through this model if all participants recognise their own input and work cohesively as a team. The problems are well recognised but a solution is hindered by the fear and apprehension of taking the first step toward mutual trust; the volatile nature of the construction industry leads to an economically dependent culture and the lack of leadership to drive the shift in construction culture.

It may be necessary, therefore, for the sponsoring organisation to take a leading role, transmitting messages to the construction industry promoting these philosophies. The benefit of the model presented here, will be optimised by a common effort and the development of long term relationships. The model acts to redefine the boundaries drawn around the client project organisation, extending it to include the whole project organisation. More emphasis is placed upon the role of the contractor on site, of the relationship between design and construction, on involving the appropriate persons at the stages where their input will be of most value.

In order to communicate this philosophy to the construction industry the sponsoring organisation must be exemplary: start to develop trusting relationships, dictate the roles and scope of each project participant and continuously develop the project process from project to project. The sponsoring organisation will struggle to shift the culture of the industry single handed, client organisations should converge and transmit a common message. Learning is continuous and new improved methods of value creation should be sought. This thesis provides a sample of the processes that may add value from within the client organisation. The next section will discuss the research recommended to continue the improvement process.

12.4 Recommended future research

During the course of this research it became apparent that there are similarities between the new product development process in the manufacturing industry and the construction project process. In this regard it is considered beneficial for a study to be conducted comparing the two processes and benchmarking specific areas of excellence within the manufacturing industry. Alongside this, the manufacturing industry in the UK has undergone the type of cultural shift discussed in the previous section, the lessons learned from this change could be useful to the construction industry.

The data collection for this thesis exposed the researcher to the North American and Japanese construction environment highlighting areas of excellence for injection into the strategic project management model. It is recommended that the areas of

excellence highlighted in this thesis are investigated in more detail , as a further benchmarking exercise. For example the nature of the client and customer interface in North America; the way effectiveness of the strategic project management role witnessed in North America; the management of problems associated with the careful balance of long term relationships in Japan. These issues were discussed with the limited sample during this research study, a further study would enhance the detail and improve the robustness of the results.

Having investigated the management of construction projects within the context of the airport business, it may be beneficial to conduct a similar study of project management within alternative industries. In this way it may be possible to highlight areas of excellence in particular industries such that a bank of learning may be established. The process industries are often exemplified for project planning and control, it may be possible to transport some of the techniques used into the construction industry.

The need for a model to assist the management of small projects was clearly identified within this thesis. A suggested amendment to the strategic project management framework was presented in chapter 10, but this arose from a brief study of the small projects within BAA plc. It is recommended that further research is conducted over a large research sample in order to generate a model of the strategic management of small projects. This is an area which is rarely given emphasis within an organisation due to the low cost of each individual project. However, the compounded effect of many small projects can be more significant than a major project.

Finally, any model is incomplete until it has been proved by implementation and successful results. Whilst the strategic project management model has been tested across a sample of knowledgeable persons, it has not been used on a live project in its entirety. Elements of the model have been introduced into the sponsoring organisation as policy statements and acceptance has been gained from influential persons within and outwith the organisation. This research will be followed by an implementation program within the sponsoring organisation, including a training program for members

of the sponsoring organisation and the associated construction organisations. It is recommended that a group of influential clients, with significant procurement programmes, form a group to support the efforts of those attempting to shift the culture of the UK construction industry to reflect the new paradigm presented in this thesis. In this way the relative small efforts of individual organisations may cumulatively work toward the amelioration of the UK construction product.

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